~~Vol. 940~~ Number 1

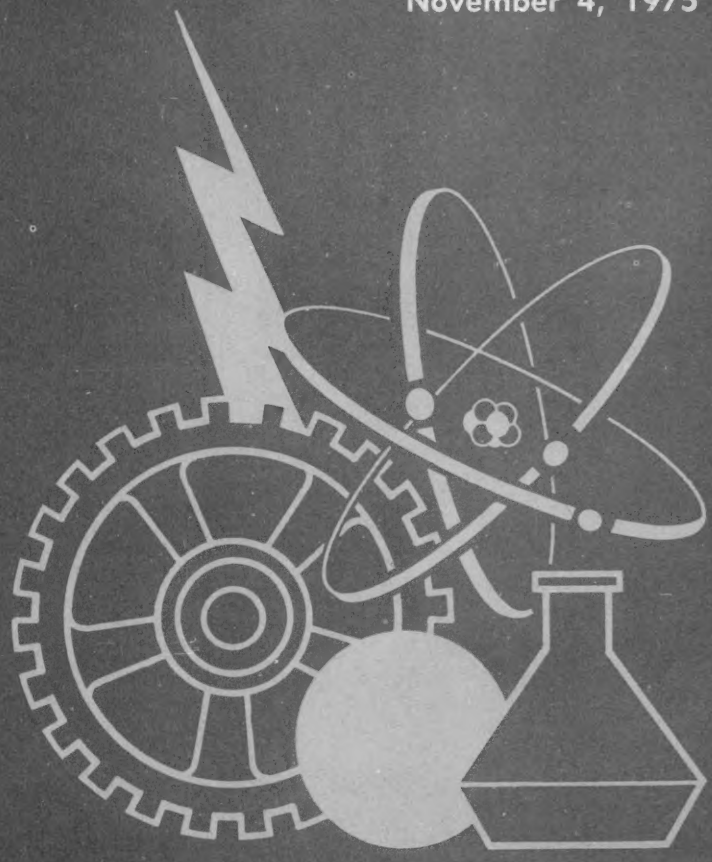
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

November 4, 1975



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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

November 4, 1975 Volume 940 Number 1

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PATENT AND TRADEMARK OFFICE NOTICES

Board of Appeals Decisions Rendered in the Month of September 1975

Examiner affirmed	254
Examiner affirmed in part	43
Examiner reversed	76
Total	373

The Paris Convention for the Protection of Industrial Property

The German Democratic Republic

The Government of the United States of America considers the accession of the German Democratic Republic to the Paris Convention for the Protection of Industrial Property as revised at Stockholm on July 14, 1967 to be effective as of December 4, 1975.

Consequently, an application filed in the German Democratic Republic on or after December 4, 1975, may form the basis for claiming a right of priority in an application filed with the U.S. Patent and Trademark Office.

C. MARSHALL DANN,
Oct. 7, 1975. *Commissioner of Patents and Trademarks.*

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,855,744, W. H. Phelps, FORAMINOUS GRASS CATCHER; **2,983,096,** same, ROTARY CUTTER AND HOUSING STRUCTURE, **filed** July 10, 1975, D.C., W.D. Wis. (Madison), Doc. 74–C–187, *Sensation Corporation* v. *Wisconsin Marine, Inc.* Dismissed by stipulation, Jan. 31, 1975.

2,876,985, Birchall, Jr. and Purdy, ROTARY VALVES FOR LABORATORY GLASSWARE AND THE LIKE, **filed** Mar. 20, 1975, D.C.N.J. (Camden), Doc. C–75–0472, *Fischer & Porter Company* v. *Lurex Manufacturing Co. Inc.*

2,929,249, J. E. Lindsay, PRESSURE GAGE; **3,258,955,** same, METHOD OF MANUFACTURING A PRESSURE SENSING ELEMENT; **3,375,719,** same, PRESSURE GAUGE, **filed** July 24, 1975, D.C., C.D. Calif. (Los Angeles), Doc. 75–2518–DWW, *James E. Lindsay* v. *HTL Industries, Inc.*

2,983,096. (See 2,855,744.)

3,002,600, M. A. Campbell, FLEXIBLE FEED TRACK, **filed** Apr. 17, 1975, United States Court of Appeals, Sixth Circuit, Ohio (Cincinnati), Doc. 74–2157, *Milford A. Campbell* v. *Spectrum Automation Company.* Patent is invalid under Title 35 U.S.C. Section 102(b), Apr. 17, 1975.

3,006,173, F. R. Shoaf, YARN CLAMPING AND CUTTING MEANS AND MEHTOD FOR KNITTING MACHINES, **filed** July 3, 1975, D.C., W.D.N.C. (Charlotte), Doc. C–C–75–209, *H. E. Crawford Co., Inc.* v. *Speizman Industries, Inc.* Notice of dismissal filed by plaintiff, Aug. 6, 1975.

3,014,984. I. C. Jacobsen, UNDERWATEk TELEVISION DEVICE, **filed** Dec. 31, 1974, United States Court of Claims (District of Columbia), Doc. 355–70, *Jacobson Brothers, Inc., Elisa E. Jacobson, Sofus T. Jacobson and Isidor R. Jacobson* v. *The United States.* Claims 1, 2, 4, 6 and 7 held invalid as obvious from the prior art under 35 U.S.C. 103, Mar. 19, 1975.

3,047,040, T. A. O. Gross, PNEUMATIC LOAD BEARING DEVICES, **filed** Feb. 11, 1975, United States Court of Appeals for the First Circuit, Massachusetts (Boston), Doc. 75–1064, *Thomas A. O. Gross* v. *General Motors Corporation.*

3,063,457, Bitnner and Gnass, FOOT EXERCISER SANDALS, **filed** Feb. 26, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c622, *Scholl, Inc.* v. *Modern Shoe Co.*

3,078,172, L. L. Libby, PREPARED FROZEN FOOD FOR COOKING AND METHOD OF PREPARING THE SAME, **filed** Apr. 15, 1975, D.C., S.D. Fla. (Miami), Doc. 75–597–C–JE, *Tra-Way Corp.* v. *The Great Atlantic & Pacific Tea Co., Inc.*

3,116,557, J. R. Trice, Jr., METHOD AND MEANS FOR LAYING SEWER PIPE, **filed** Feb. 4, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c335, *Laser Alignment, Inc.* v. *Coherent Radiation et al.* Pursuant to stipulation enter order of dismissal, Dec. 5, 1974.

3,153,509, V. W. Curtis, MANUALLY MANEUVERABLE ROW CROP SPRAYER, **filed** July 17, 1975, D.C., W.D. Ky. (Bowling Green), Doc. C–75–0043–B(B), *Vernie Curtis and Walter Leroy Curtis* v. *Reid Welch.*

3,166,154, J. M. Titzel, PORTABLE SCAFFOLDS AND WORK TOWERS, **filed** May 13, 1975, D.C., N.D. Ohio (Youngstown), Doc. C–75–54–Y, *Vulcan, Inc.* v. *Fordees Corporation.*

3,172,991, R. F. Arnoldy, FEEDER FOR WELDS, **filed** Aug. 4, 1972, D.C. Del. (Wilmington), Doc. 4442, *Stamicarbon, N.V. and Mathieu Vongard* v. *The Chemical Construction Corporation.* Judgment entered in favor of plaintiffs, July 30, 1975.

3,180,074, J. F. Smith, HIGH SPEED SPINDLE APPARATUS, **filed** July 30, 1975, D.C.N.C. (Charlotte), Doc. C–C–75–238, *Joseph F. Smith* v. *American Barmag Corporation.*

3,253,292, A. M. Herschensohn, HAIR BRUSHES, **filed** June 13, 1975, D.C., C.D. Calif. (Los Angeles), Doc. 75–2009–DWW, *Arthur M. Herschensohn and Corona Hair Net Corp.* v. *Robert M. Hoffmann et al.* **Same, filed** Aug. 6, 1975, D.C., C.D. Calif. (Los Angeles), Doc. 75–2658–RF, *Arthur M. Herschensohn and Corona Hair Net Corporation* v. *David Ruby and Arco Products Co. et al.*

3,258,955. (See 2,929,249.)

3,270,268, Carmichael, Maier and Schilling, ALTERNATOR WITH SILICON CONTROLLED RECTIFIER REGULATOR FOR BATTERY CHARGING, **filed** July 29, 1975, D.C., N.D. Tex. (Dallas), Doc. CA–3–75–0936B, *Syncro Corporation* v. *ECC Corporation.*

3,275,316, G. V. Cleary, Jr., INSERT FOR NEWSPAPERS, **filed** Apr. 28, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c1345, *Free Standing Stuffer, Inc.* v. *Florida's Mackle Brothers, Inc. et al.* **Same, filed** May 23, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c1677, *Free Standing Stuffer, Inc.* v. *Liggett & Myers, Incorporated.*

3,294,421, M. H. Mathisen, SWAY CONTROL MEANS FOR TRAILERS, **filed** Feb. 28, 1975, D.C., E.D. Calif. (Sacramento), Doc. S–75–145, *Eaz-Lift Spring Corporation* v. *Valley Tow-Rite Incorporated et al.*

3,375,719. (See 2,929,249.)

3,375,800, Cole and Buller, SEISMIC CABLE DEPTH CONTROL APPARATUS, **filed** July 25, 1975, D.C., S.D. Tex. (Houston), Doc. 75–H–1288, *Continental Oil Company* v. *Jimmy R. Cole, doing business as Jim R. Cole & Associates and Cole Development Company, Inc.*

3,485,587, Chapman and Elmer, POROUS HIGH SILICA GLASS, **filed** July 30, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c2536, *Miles Laboratories, Inc.* v. *Boehringer Mannheim Corp. et al.*

3,696,625, J. M. Alexander, POST IMPLANTING METHOD AND VEHICULAR APPARATUS THEREFOR, **filed** Nov. 1, 1973, D.C., E.D. Tex. (Sherman), Doc. S–73–CA–72, *Stillwell-Gerard Construction Co.* v. *Reed Tool Company.* Plaintiff's claim for damages resulting from defendant's act of infringement to date with regard to U.S. Letters Patent settled, which settlement includes assignment of said patent to Reed, with other conditions, judgment entered July 30, 1975.

3,850,845, G. C. Vickery, METAL OXIDE PASTE DISPERSIONS AND USE AS CURING AGENTS, **filed** May 6, 1975, D.C. Del. (Wilmington), Doc. 75–120, *Basic, Inc.* v. *Kenrich Petrochemicals, Inc.*

D. 229,158, V. G. Marotta, COFFEE BREWER, **filed** Feb. 28, 1975, D.C., C.D. Calif. (Los Angeles), Doc. 75–757–AAH, *North American Systems, Inc.* v. *Grandinetti Products, Inc.*

Certificates of Correction for the Week of Nov. 4, 1975

Re. 28,198	3,868,649	3,886,936	3,894,844
Re. 28,369	3,869,050	3,887,199	3,895,006
D. 235,309	3,869,481	3,887,504	3,895,217
3,418,553	3,869,888	3,887,625	3,895,227
3,630,681	3,870,017	3,887,987	3,895,368
3,666,858	3,870,387	3,888,209	3,895,459
3,773,804	3,871,084	3,888,460	3,895,874
3,774,088	3,871,816	3,888,491	3,895,905
3,789,295	3,872,564	3,888,551	3,895,945
3,792,084	3,872,656	3,888,649	3,895,980
3,801,474	3,873,594	3,889,328	3,896,029
3,804,865	3,875,202	3,889,810	3,896,052
3,806,620	3,875,211	3,889,841	3,896,176
3,808,698	3,875,238	3,890,231	3,897,093
3,809,923	3,875,759	3,890,373	3,897,139
3,816,420	3,876,726	3,890,487	3,897,196
3,817,559	3,878,316	3,890,719	3,897,431
3,824,484	3,878,994	3,890,773	3,897,572
3,828,005	3,879,497	3,890,837	3,897,797
3,828,037	3,879,543	3,891,164	3,898,271
3,834,940	3,879,771	3,891,385	3,898,448
3,836,210	3,879,994	3,891,444	3,898,728
3,843,888	3,880,117	3,891,503	3,898,776
3,845,991	3,880,628	3,891,617	3,898,784
3,847,597	3,880,691	3,891,687	3,898,848
3,850,630	3,880,764	3,891,778	3,898,918
3,850,835	3,880,934	3,891,864	3,899,332
3,852,440	3,881,298	3,891,954	3,899,631
3,853,611	3,881,402	3,892,442	3,899,729
3,853,911	3,881,658	3,892,537	3,899,762
3,854,523	3,882,004	3,892,644	3,900,315
3,855,342	3,882,563	3,892,823	3,900,384
3,855,497	3,882,665	3,893,030	3,900,436
3,857,775	3,882,804	3,893,436	3,900,686
3,857,821	3,882,980	3,893,967	3,900,819
3,858,184	3,883,305	3,894,011	3,900,924
3,860,104	3,884,559	3,894,112	3,901,019
3,864,150	3,884,983	3,894,124	3,901,393
3,865,584	3,885,300	3,894,146	3,902,124
3,865,968	3,885,810	3,894,278	3,902,710
3,866,661	3,885,825	3,894,396	3,903,006
3,867,132	3,886,774	3,894,568	3,903,212

Adverse Decisions in Interferences

In the designated interference involving the indicated claims of the following patents, final decisions have been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 3,526,070, M. W. Deason, POOL DECK FORM, Interference No. 97,574, decided Dec. 18, 1973, claims 1 and 3.

Patent No. 3,549,677, W. J. Griebstein, R. J. Grabenstetter and J. S. Widder, STANNOUS SALTS OF POLYPHOSPHONIC ACIDS, Interference No. 98,076, decided Sept. 16, 1974, claims 1, 3 and 5.

Patent No. 3,550,129, E. R. Steele, SATELLITE AIDED VEHICLE AVOIDANCE SYSTEM, Interference No. 98,292, decided May 30, 1975, claims 1, 2, 3, 15, 16, 17, 29, 30 and 31.

Patent No. 3,601,574, T. E. Fiddler, PART STRUCTURE FOR PROJECTION WELDING A NON-METALLIC BODY TO A METAL PART, Interference No. 97,900, decided Sept. 16, 1975, claims 1, 2 and 3.

Patent No. 3,610,993, R. B. Randels, ELECTRONIC IMAGE DEVICE WITH MESH ELECTRODE FOR REDUCING MOIRE PATTERNS, Interference No. 98,325, decided June 5, 1975, claims 1, 2 and 5.

Patent No. 3,656,932, H. Scheuermann and A. Fischer, PROCESS FOR CONTROLLING UNDESIRED VEGETATION, Interference No. 98,581, decided Aug. 15, 1975, claim 2.

Patent No. 3,661,851, W. Umbach, R. Mehren and W. Stein, POLYALKYLENEGLYCOL ETHERS OF HYDROXYALKYLMERCAPTANS AND PROCESS, Interference No. 98,845, decided July 3, 1975, claim 2.

Patent No. 3,666,021, H. L. Whitehouse, POWER TOOL HAVING PROPORTIONING TRANSMISSION, Interference No. 98,186, decided Apr. 16, 1975, claims 1, 2 and 4.

Patent No. 3,666,802, Z. Jacura, P. Adams and B. R. Juliano, RECOVERY OF 3-(3,4-DIHYDROXYPHENYL)-L-ALANINE FROM BEANS WITH WATER, Interference No. 98,916, decided July 15, 1975, claim 1.

Patent No. 3,681,380, R. D. G. Cooper and D. S. Fukuda, THIAZOLINE AZETIDINONES, Interference No. 98,752, decided June 17, 1975, claim 4.

Patent No. 3,696,229, T. L. Angelucci and F. W. Kulicke, Jr., BONDING TOOL FOR THROUGH THE TOOL OBSERVATION BONDING AND METHOD OF BONDING, Interference No. 98,794, decided June 23, 1975, claims 21, 22, 23, 24, 25, 26, 27 and 28.

Patent No. 3,704,445, R. R. Lanham, DIGITAL READ OUT INDICATOR FOR VEHICLES, Interference No. 98,758, decided July 3, 1975, claims 1 and 5.

Patent No. 3,705,356, W. G. Russell, AFT SYSTEM FOR SIGNAL RECEIVER OF TYPE HAVING TUNER EMPLOYING VARACTOR DIODE, Interference No. 98,599, decided July 24, 1975, claims 1 and 2.

Patent No. 3,732,543, E. Y. Rocher and S. E. Schuster, LOOP SWITCHING TELEPROCESSING METHOD AND SYSTEM USING SWITCHING INTERFACE, Interference No. 98,684, decided July 3, 1975, claims 1, 3 and 4.

Patent No. 3,755,454, Y. G. Chang and P. S. Bailey, ORGANIC PEROXIDES AND METHOD THEREFOR, Interference No. 98,887, decided June 17, 1975, claims 1, 2, 3, 4, 5 and 8.

Patent No. 3,783,696, C. M. Coleman, AUTOMATIC VOLUME CONTROL PIPET, Interference No. 98,799, decided July 30, 1975, claim 1.

Patent No. 3,795,355, D. E. Gerstein, DISPENSER FOR INDIVIDUALLY DISPENSING THE ENDMOST SHEET OF A CONTINUOUS WEB OF CONNECTED SHEETS, Interference No. 98,907, decided June 27, 1975, claims 1, 2, 3, 4, 7, 9, 11 and 15.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF OCTOBER 11, 1975

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-30-75
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	11-13-74
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	1-6-75
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	1-6-75
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-7-75
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	12-9-75
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	9-13-74
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	2-3-75
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	3-20-75
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-5-74
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	7-3-74
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	1-31-75
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	2-5-75
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	2-11-75
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	1-6-75
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	3-31-75

Expiration of patents: The patents within the range of numbers indicated below expire during November 1975, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,858,537 to 2,862,204 inclusive
Plant Patents..... Numbers 1,768 to 1,774 inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED NOVEMBER 4, 1975

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T940,001

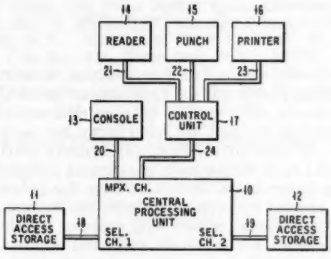
METHOD AND APPARATUS FOR PRODUCING CUSTOMIZED PROGRAMMING INFORMATION

Bryce F. Ells, Bellevue, Wash., and Joyce M. Wrenn, Sunnyvale, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of application Ser. No. 313,718, Dec. 11, 1972, which is a continuation of application Ser. No. 99,488, Dec. 18, 1970, now abandoned. This application Oct. 29, 1973, Ser. No. 411,594

Int. Cl. G06d *9/00*
U.S. Cl 444—1

38 Sheets Drawing. 170 Pages Specification



Method and apparatus for providing programs for a computer in response to answers to a questionnaire, the questions being arranged in individually identified sets. The answers comprise entries that may be a selection from among predetermined alternatives may be a supplied stipulation. The entries are checked in accordance with predetermined verification instructions associated with the set identification. The checks include whether each stipulation is of a designated type and value range, and include whether a designated number or designated ones of the alternatives were selected, the designations being by the associated verification instructions. An error output indication is generated in response to the negative result of any of the checking steps. Each entry is then responded to in accordance with predetermined customizing instructions associated with the set identification to select ones of the customizing instructions as directed by the selected alternatives and stipulations and modify certain specifications in the customizing instructions as directed by the supplied stipulations. The customizing instructions refer to designated statements comprising specifications of program steps and may delete, select or modify the designated statements, subject to further deletion, selection or modification in accordance with other instructions. Those customizing instructions that are activated are sorted into the order of appearance of the statements and employed to delete, select and modify the designated statements in accordance with inclusion codes thereof. The statements comprising specifications of program steps are provided at an output in the form of an actual computer program or in the form of information translatable directly into a computer program.

T940,002

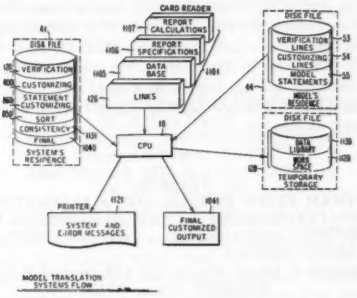
METHOD AND APPARATUS FOR PRODUCING CUSTOMIZED AND USER-ADDED PROGRAMMING INFORMATION

Donald J. Costa and Harry D. Entz, San Jose, George E. Espersen, Los Gatos, Edward A. Lane, San Jose, Ernest H. Mashburn, Boulder Creek, Jack B. Mumford, Saratoga, and Edward H. Nelson, San Jose, Calif., Frank John Fendt, Barrington, Ill., and Richard W. Wright, Marlton, N.J., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of application Ser. No. 313,910, Dec. 11, 1972, which is a continuation of application Ser. No. 99,492, Dec. 18, 1970. This application Nov. 9, 1973, Ser. No. 414,550

Int. Cl. G06f *9/16*
U.S. Cl. 444—1

19 Sheets Drawing. 50 Pages Specification



Method and apparatus for incorporating user-added data base, report specification, and calculation program information into programs for a computer that are customized in accordance with responses to a questionnaire. User-added program information is especially identified and supplied together with the responses to the questionnaire for verification. The responses are checked in accordance with verification instruction, none of which are directed to the especially identified program information. The verified responses are employed to select and modify customizing instructions which, in turn, delete, select, and modify program statements. The especially identified program information together with certain of the program statements are sorted into a sequential arrangement and are checked for consistency and for agreement with any prior stored information. The program information and selected program statements are then sorted into final output format and supplied as final output.

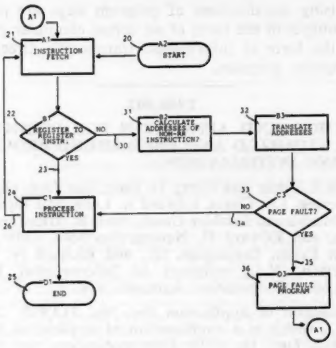
T940,003

MEMORY SIZE INDEPENDENT DATA PROCESSING SYSTEM AND METHOD

Charles D. Coleman, Marina Del Rey, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of application Ser. No. 207,508, Dec. 13, 1971. This application Nov. 12, 1973, Ser. No. 415,087

Int. Cl. G06f *9/12*
U.S. Cl. 444—1
25 Sheets Drawing. 76 Pages Specification



A data processing system having an architecture in which all functions are conducted employing a method of virtual memory addressing, including all input and output functions. Any use of memory by the system, whether for data, program, workspace, etc., is by virtual address, requiring transiation to a real address. The sole function employing real addresses is a virtual memory paging operation which is separate from all other input/output functions. In this manner, the system considers all programming and all data to be located in a large virtual memory but which are actually paged into a real main memory as needed.

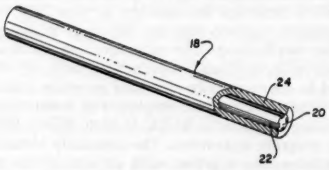
T940,004

LAMINAR FLOW DEVICE FOR CALIBRATING A TOBACCO SMOKE FILTER ROD PRESSURE DROP TESTING APPARATUS AND METHOD FOR MAKING DEVICE

Ronald L. Dixon, Rte. 9, 316 Thistlewood Drive, Kingsport, Tenn. 37663

Filed Feb. 1, 1974, Ser. No. 438,817

Int. Cl. G01f *25/00*, F15d *1/02*
U.S. Cl. 73—3
1 Sheet Drawing. 10 Pages Specification



A laminar flow device for calibrating a tobacco smoke filter rod pressure drop testing apparatus, and the method of making such device. The device is a small cylindrical rod having within and spaced around its periphery a plurality of grooves extending axially along its length. The grooves are of constant depth and the cross-sectional area of each groove is small enough to promote laminar flow of a fluid medium through the groove. The open side of each groove is covered by a cylindrical sleeve having an interference fit over the length of the cylindrical rod and being slidably adjustable to cover or uncover a predetermined length of the grooves for determining different pressure drops at predetermined fluid flow rates.

T940,005

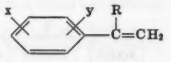
VERSATILE WATER/SOLVENT SOLUBLE POLYMER AND COATING COMPOSITION OF THE POLYMER

Joseph A. Vasta, Woodbury, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation of application Ser. No. 263,761, June 19, 1972, which is a continuation-in-part of application Ser. No. 36,480, May 11, 1970, both now abandoned. This application Apr. 29, 1974, Ser. No. 464,897

Int. Cl. C08g *51/24*
U.S. Cl. 260—29.4 UA
No Drawing. 29 Pages Specification

A novel polymer which is soluble in water and in solvents that forms a high quality coating composition is the subject of this invention. The novel polymer comprises (1) an aromatic compound of the general formula



where *x* and *y* can be hydrogen, chlorine, bromine, or an alkyl group and R can be hydrogen or an alkyl group; (2) an acrylic ester, such as an alkyl methacrylate or an alkyl acrylate in which the alkyl group has 1–12 carbon atoms; (3) vinyl pyrrolidone; (4) hydroxy alkyl acrylic ester and (5) an ethylenically unsaturated carboxylic acid. Coating compositions formulated from this polymer, that has an unusual hydrophilic/hydrophobic balance, can be reduced to a spray viscosity with water or solvents which are considered not to be air pollutants which allows a manufacturer to comply with current pollution laws. The composition may also contain a thermosetting resin and be utilized in electrocoating processes. Also, the polymer forms coatings which are durable, grease resistant, scratch resistant, hard and adhere well to metal substrates, and are useful, for example, as appliance enamels.

T940,006

PLASTICIZER BLENDS FOR TOBACCO SMOKE FILTER RODS AND FILTER RODS BONDED BY SUCH BLENDS

Gerald P. Morie, 2317 Briarcliff Road, and Cephas H. Sloan, Rte. 5, both of Kingsport, Tenn. 37660

Filed May 31, 1974, Ser. No. 475,342

Int. Cl. A24b *15/02*
U.S. Cl. 131—267
No Drawing. 6 Pages Specification

Plasticizer blends for bonding at room temperature tobacco smoke filter rods formed of cellulose acetate filaments and comprising about 40 to about 70% by weight of (triacetin) glycerol triacetate and about 30 to about 60% by weight of a low-vapor pressure ester selected from the group comprising triethyl citrate, acetyltriethylcitrate, trimethylol propane triacetate, 2,2,4-trimethyl, 1,3-pentanediol diacetoacetate and 1,3-butanediol diacetoacetate. The amount of blend applied to the cellulose acetate filaments comprises about 6 to about 20% of the weight of the cellulose acetate filaments, and preferably about 6 to about 11% of the weight of the cellulose acetate filaments. The invention is also directed to a tobacco smoke filter rod as bonded with such plasticizer blends.

T940,007
CONVERSION OF WASTE RUBBER TO FUEL AND OTHER USEFUL PRODUCTS

John W. Larsen, Rte. 3, Joe Lewis Road, Knoxville, Tenn. 37920

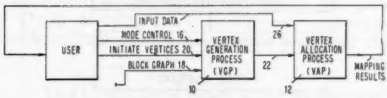
Filed May 17, 1974, Ser. No. 470,862
Int. Cl. C10l *5/48*
U.S. Cl. 44—1 D
No Drawing. 14 Pages Specification

Heretofore waste rubber, a substantial amount of it in the form of used automobile tires, has been buried, burned, or otherwise disposed of in manners and by means totally inconsistent with good ecological practices and considerations. Now, such waste or scrap rubber, both natural and synthetic, can readily be converted in the presence of molten acidic halide Lewis salt catalysts to useful products, including fuels comprising a naphttha-like oil, a burnable solid carbonaceous material, and a mixture of gases. The most promising salts are zinc chloride, tin chloride, and antimony iodide. Also, an extremely active catalyst can be prepared by adding up to about 60 percent by weight of sodium chloride to the zinc chloride catalyst. The burnable carbonaceous material has been shown to be a carbon black of moderate quality and is believed to be suitable for reuse in tires if blended with high-quality fresh carbon black.

T940,008
AUTOMATED LOGIC MAPPING SYSTEM

Peter H. Oden, 120 Pines Bridge Road, Ossining, N.Y. 10562; Roy L. Russo, 1793 Blossom Court, Yorktown Heights, N.Y. 10598; and Peter K. Wolff, Sr., Glen Road, P.O. Box 426, Shrub Oak, N.Y. 10588

Continuation of application Ser. No. 300,954, Oct. 26, 1972. This application May 17, 1974, Ser. No. 470,871
Int. Cl. G06f *9/06, 13/00*
U.S. Cl. 444—1
8 Sheets Drawing. 34 Pages Specification



A process for allocating a plurality of block units with a predescribed interconnection specification, to a plurality of module units. The allocation process may be varied from a partition having a zero block redundancy, to a mapping which has some degree of redundancy for the purpose of minimizing the total number of modules required. The process is applicable to any system wherein interconnected block sub-units must be assigned to larger module units for organizational purposes. For example, the allocation of circuits to chip structures.

In the present invention an automatic process for mapping blocks to modules is provided. The process consists of a set of programs that operate on a given block graph input and provide an output graph which may take the form of either a partition or a mapping.

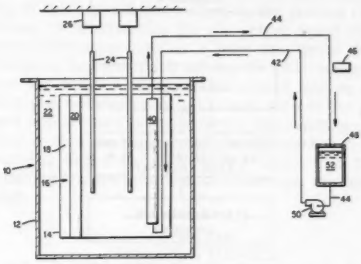
The automated mapping process consists of two major consistituents, a vertex generation program (VGP) and a vertex allocation program (VAP). Vertex generation is a sub-grouping process to commonly assign interconnected blocks into a subunit known as a vertex. The program begins with a list of initiate vertices to which blocks are added until a complete list of vertices is formed. The initiate vertex acts as a nucleus from which the vertex is grown. The VGP terminates by outputting a complete vertex graph that is introduced as input to VAP.

The vertex allocation phase performs a systematic assignment of vertices to modules. VAP structures the input vertex graph into a format which may be processed to determine which of the vertices may be assigned to a common module. In order to achieve a minimized cost mapping, VAP may be used iteratively by the user so as to execute a mapping onto a predetermined number of modules in accordance with a plurality of structure and user restrictions.

T940,009
MEASUREMENT OF BURNABLE POISON ABSORPTIONS AND CRITICAL ASSEMBLIES

Alvin Radowsky, Tel Aviv, Israel, assignor to the United States of America as represented by the United States Atomic Energy Commission

Filed May 23, 1974, Ser. No. 472,926
Int. Cl. G21c *17/00*
U.S. Cl. 176—19 R
1 Sheet Drawing. 8 Pages Specification



A method and apparatus is described for measuring the neutron absorption characteristics of burnable poison elements within a nuclear reactor. A container of the same size and shape of the burnable poison element is located within the core and connected to inlet and outlet lines, mixing tank means, a pump, and a counting system such that various solutions having concentrations of the burnable poison may be circulated through the reactor to determine various burnable poison absorption characteristics without shutting down the reactor.

T940,010
EDIBLE EMULSIFIERS AND PROCESS FOR MAKING SAME

William J. Simcox, 2460 Wildwood Drive, Kingsport, Tenn. 37660

Filed May 24, 1974, Ser. No. 473,105
Int. Cl. A21d *2/16*
U.S. Cl. 426—62
No Drawing. 18 Pages Specification

Finely divided edible emulsified compositions having resistance to foaming when used in bread mixes and which are also resistant to lumping, caking and dusting are prepared by incorporating a small amount of animal fat or vegetable oil into a finely divided emulsifier. The preferred emulsifiers are succinylated monoglycerides.

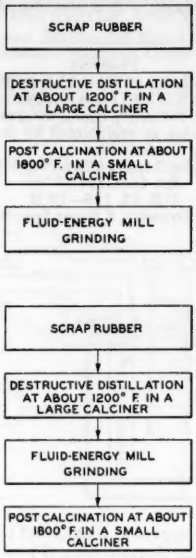
T940,011
POST-CALCINATION OF VULCANIZED-RUBBER CHAR

Grant Crane, Woodrow A. Wilson, and Edward L. Kay, Akron, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation of application Ser. No. 270,135, July 10, 1972, which is a continuation-in-part of application Ser. No. 235,982, Mar. 20, 1972, now abandoned. This application June 20, 1974, Ser. No. 481,008
Int. Cl. C09c *1/48*
U.S. Cl. 423—449
2 Sheets Drawing. 11 Pages Specification

Scrap vulcanized rubber is destructively distilled to produce a char, and this char is post-calcined at 1800° F. or thereabout, usually until the benzene-extractable content is no more than substantially 0.5 percent of the weight of the char. The post calcination preferably is carried out

in a smaller vessel than the destructive distillation. The stress-strain properties of vulcanizate reinforced with the


SCRAP RUBBER
DESTRUCTIVE DISTILLATION AT ABOUT 1200° F. IN A LARGE CALCINER
POST CALCINATION AT ABOUT 1800° F. IN A SMALL CALCINER
FLUID-ENERGY MILL GRINDING
SCRAP RUBBER
DESTRUCTIVE DISTILLATION AT ABOUT 1200° F. IN A LARGE CALCINER
FLUID-ENERGY MILL GRINDING
POST CALCINATION AT ABOUT 1800° F. IN A SMALL CALCINER

post-calcined char and the cure rate of the rubber are increased.

T940,012
RULES DRIVEN DATA MANAGEMENT PROCESS

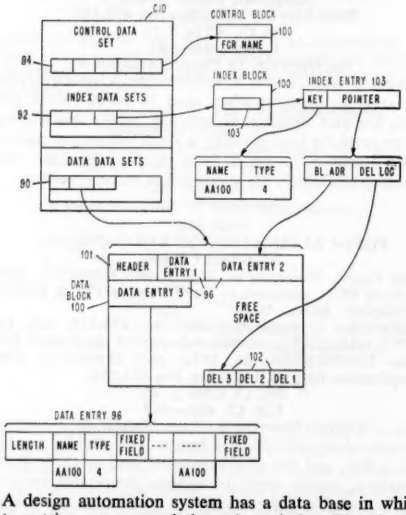
Thomas Beretvas, Poughkeepsie, Henry E. Lipman, Croton-on-Hudson, Jere L. Sandorn, Poughkeepsie, and Richard L. Taylor, Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of application Ser. No. 278,312, Aug. 7, 1972. This application June 21, 1974, Ser. No. 481,628

Int. Cl. G06f *15/40, 7/28, 9/06*

U.S. Cl. 444—1

17 Sheets Drawing. 43 Pages Specification



A design automation system has a data base in which data entries are accessed through an index. The characteristics of the data base, such as lengths, syntax, and contents of individual fields, are specified in a master rule. When a processing program accesses the data base, the master rule is also accessed to obtain the field characteristics and to use them to set up any subsidiary rules governing operation of the processing programs. Information is placed in the data base by update commands that identify the fields and contents. A language processor checks the commands and translates them into parameter lists that are used by a file processor to change the data base. Information in the data base can be used by an output processor, e.g., to format and print a logic diagram.

T940,013
NETWORK DESIGN PROCESS USING MULTIPLE PERFORMANCE FUNCTIONS

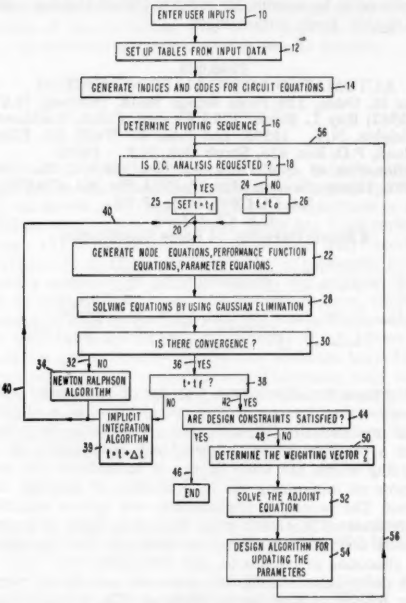
Chung W. Ho, Mahopac, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of abandoned application Ser. No. 331,711, Feb. 13, 1973. This application Sept. 17, 1974, Ser. No. 506,805

Int. Cl. G06f *15/06, 15/56*

U.S. Cl. 444—1

10 Sheets Drawing. 57 Pages Specification



This is an automated process for analyzing electrical networks.

The user of the process introduces into a computer system, initialized with a program for carrying out the process, input information consisting of a symbolic representation of an electrical network structure plus a plurality of network performance functions, together with the network elements, some of which are defined as design parameters. The input information is placed in a data storage means and is arranged into a plurality of arrays, pointers, and tables needed by the process to operate on the input information introduced by the user. The process performs either a steady state or transient analysis of the given electrical network and provides as output a list of values for the design parameters which optimize the given plurality of performance functions.

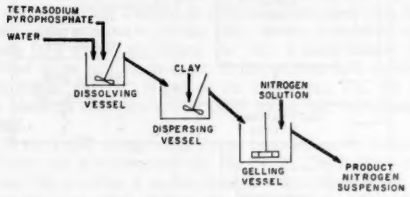
The process solves a set of node equations, performance equations, and parameter equations for either the steady

state or transient state cases. Then, the adjoint equation is solved by utilizing a weighting vector Z which attaches a relative significance to each of the performances. Both sets of equations are solved in an iterative loop to generate a sensitivity vector which is used to converge on an optimized solution of the multiple performances given by the user.

T940,014
NITROGEN SUSPENSION

David E. Nichols, 1406 Fordsway, Muscle Shoals, Ala. 35660, and Edgar W. Sawyer, Jr., 209 Gaywood Drive, Hagerstown, Md. 25411

Filed Sept. 25, 1974, Ser. No. 509,280
Int. Cl. C05b *15/00*
U.S. Cl. 71—29
2 Sheets Drawing. 11 Pages Specification

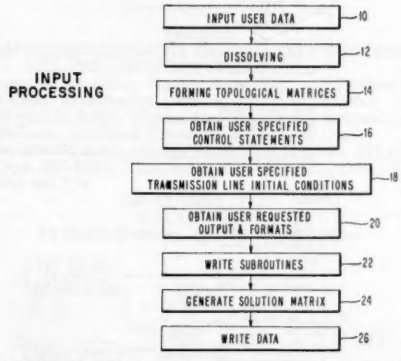


A process for the production of an improved nitrogen fertilizer suspension by dispersing attapulgite clay and water with a dispersing agent and adding the dispersed clay to the nitrogen solution to cause the clay to gel. The concentration of clay in the dispersed state can be as high as 30 percent, and with a concentration of clay in the gel state (i.e., nitrogen solution) of 2 percent, high gel strength can be obtained with only moderate agitation. The products are useful in making mixed high-nitrogen suspensions that also contain phosphorus and potassium by simply blending the base nitrogen suspension with phosphate base suspension and solid potassium chloride.

T940,015
TRANSMISSION LINE ANALYSIS AND DESIGN PROCESS

Chung W. Ho, Mahopac, and Terrence R. Scott, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of abandoned application Ser. No. 360,244, May 14, 1973. This application Oct. 3, 1974, Ser. No. 511,892
Int. Cl. G06f *15/06, 15/56*
U.S. Cl. 444—1
17 Sheets Drawing. 52 Pages Specification

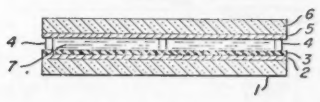


This is a process for analyzing and designing electrical networks containing coupled and uncoupled lossless transmission lines. Such networks are referred to as transmission line networks. The user of the process introduces into a computer system, which is initialized with a program for carrying out the analysis and design process, input information consisting of a symbolic representation of a transmission line network. User input information is first arranged in a data storage means and is then converted into a plurality of arrays, pointers, and tables, as needed by the process to operate on the input information. Then a set of tableau equations which represent the transmission line network are solved in a hierarchial loop structure. Within the iterations executed in the time loops, the time increments are of variable size depending on the rate of convergence in the solution of the equations. In addition, actual input signal values into the transmission lines in the network are utilized in the process of extrapolating or interpolating for the output signal values of those transmission lines at a later time point during a Newtonian iteration. After solving the set of tableau equations, the solution vector is introduced into an optimization process which controls re-execution of the process. Upon optimization being achieved, the resulting solution vector is then used to control the fabrication of a mask generating device for realizing the layout of a network containing transmission line structures for the optimized design.

T940,016
IMAGING DEVICE

Kyler F. Nelson, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 13, 1975, Ser. No. 540,618
Int. Cl. G03g *5/34*
U.S. Cl. 96—1.5
1 Sheet Drawing. 6 Pages Specification



An imaging cell is provided with uniform spacing between substrates by vacuum evaporation of photoconductive or metallic material upon one cell substrate to form spacers during fabrication of the cell. In a preferred embodiment, an electrooptic cell comprises a bottom electrode (conductive, semi-transparent coating **2** on substrate **1**), an overcoating of photoconductive arsenic triselenide **3**; four or more arsenic triselenide posts **4** vacuum evaporated upon the arsenic triselenide photoconductive layer **3** and uniformly spaced along the edge of the photoconductive layer **3**; and, a layer **7** of liquid crystalline material residing on the photoconductive layer **3** and a top electrode (conductive, semi-transparent coating **5** on substrate **6**) in contact with the layer **7** of liquid crystalline material and residing on the arsenic triselenide spacers **4**. The improved uniformity of spacing can be applied to any device, with or without a photoconductive layer, in which uniformity of imaging layer thickness is desired.

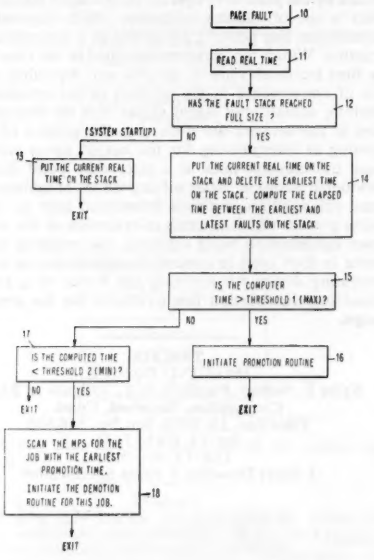
T940,017
RESOURCE BALANCING SYSTEM FOR MULTIPROGRAMMING SYSTEMS WITH A VIRTUAL MEMORY AND PAGING ALLOCATION

Donald Dean Chamberlin, San Jose, Calif., Samuel Henry Fuller, Pittsburgh, Pa., and Leonard Ying-Wu Liu, Saratoga, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 13, 1974, Ser. No. 450,622
Int. Cl. G06f *9/18*
U.S. Cl. 444—1
1 Sheet Drawing. 6 Pages Specification

A virtual memory system includes a main memory which accommodates several jobs on a time shared basis. When a job requires data not in the main memory, sec-

ondary memory is accessed by means of a signal known as a page fault. A list (stack) of page faults and their real times is recorded. At the time of each fault, the elapsed time for a full stack of faults is calculated and tested to find whether it exceeds a maximum. If so, a new



job is then added to the jobs being performed by the system. If the elapsed time is less than a minimum, then the job with the earliest promotion time is demoted from the jobs being performed.

T940,018

PAGE ALLOCATION STRATEGY FOR MULTIPROGRAMMING SYSTEMS WITH VIRTUAL MEMORY

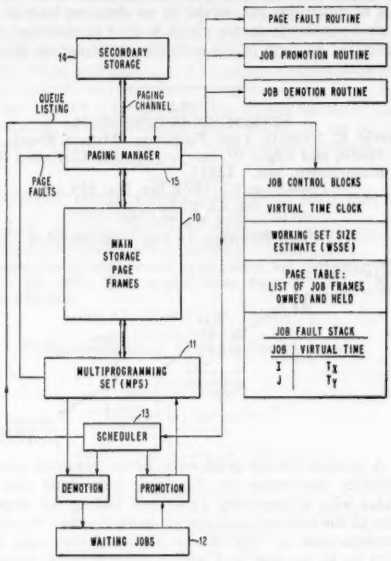
Donald Dean Chamberlin, San Jose, Calif., Samuel Henry Fuller, Pittsburgh, Pa., and Leonard Ying-Wu Liu, Saratoga Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 13, 1974, Ser. No. 450,626

Int. Cl. G06f *9/18*
U.S. Cl. 444—1

3 Sheets Drawing. 7 Pages Specification

A time shared virtual memory system can share main memory among plural jobs. When a page of data needed by a job is not in main storage, a "page fault" is generated causing the page to be fetched from secondary storage into a main storage page frame which is stolen by a job with less than average execution time per fault from the job with the highest execution time per fault. Other jobs must use unheld frames or refill a least recently used frame owned by that job. Track is kept of the amount of elapsed execution (virtual) time used by the job to calculate average execution time. Waiting jobs are promoted into the multiprogramming set of jobs being performed. The WSSE of a job is set arbitrarily or used to allocate the number of page frames for the job from other jobs, preserving current proportional frame allocation. A demoted job releases page frames to be as-



signed to other jobs in proportion to their current ownership of frames.

T940,019

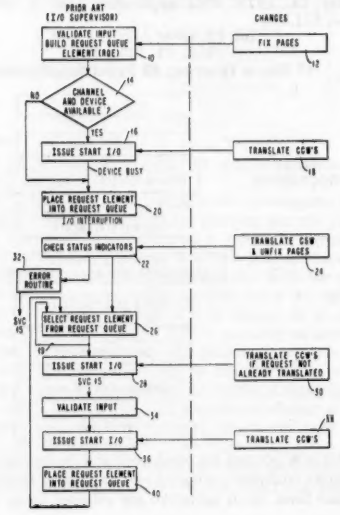
CHANNEL PROGRAM TRANSLATION

Lawrence Edward Larson, Vestal, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of application Ser. No. 211,913, Dec. 27, 1973. This application Mar. 26, 1974, Ser. No. 454,895

Int. Cl. G06f *13/08, 9/20*
U.S. Cl. 444—1

23 Sheets Drawing. 61 Pages Specification



A CCW (channel command word) string in virtual memory is moved to real storage addresses, and the data addresses in the CCW string are replaced with corresponding real addresses.

The I/O supervisor (IOS) checks all input received (block **10**) and builds a control block called a request queue element (RQE). If needed, IOS fixes the pages contained in the control blocks passed to it (block **12**). If a device is free (block **14**), a start I/O instruction is issued (block **16**). CCW translation **18** is necessary to insure that the channel program contains only real addresses.

A table of limit addresses is constructed in a work area and contains the address of the first virtual CCW in a string and the address of the current CCW undergoing translation. Transfer-in-channel commands (TIC's) (commands which branch to another part of the channel program) have their transfer-to addresses compared with the limit addresses stored in the table. If the transfer-to address falls within the limits, the TIC is immediately resolved to its real counterpart. If the address falls outside the limits, the TIC is put on an unresolved TIC list to be resolved after the entire CCW string has been translated.

If the CCW string crosses page boundaries, an indirect address list is constructed for the CCW. The indirect address list provides a series of beginning addresses for a discontinuous string of data storage. The list is referenced by an indirect address stored in the translated CCW. A flag is turned on in the CCW to indicate to the channel program that the indirect address list is to be referenced.

If a device or channel is busy or unavailable, the I/O supervisor places the RQE into a queue (block **20**).

If CCW translation was performed during the start I/O operation, the channel status word (CSW) is translated (block **24**) so that it contains the correct virtual address. Any pages specifically fixed for this I/O operation are now unfixed. Status indicators are checked (block **22**). If the I/O activity was not completed successfully, the supervisor invokes an error routine (block **32**) which may attempt the activity again.

If the I/O activity was completed successfully, previously scheduled I/O operations are started by selecting an RQE from the request queue (block **26**). The queue is checked repeatedly (path **19**) until no scheduled requests remain. A start I/O is issued for each request (block **28**) and CCW's not already translated are translated (block **30**).

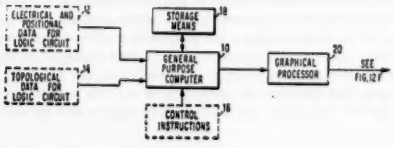
If an error routine **32** is invoked, return from the routine enters the I/O supervisor via SVC**15**. The operation is retired as illustrated by blocks **34**, **36**, **38** and **40**.

T940,020
AUTOMATIC CIRCUIT GENERATION PROCESS AND APPARATUS

George E. Brechling, Gaithersburg, Md., and William F. Colton, Woodbridge, Rita R. Marshall, Fairfax, and Walter H. Elder, Vienna, Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of abandoned application Ser. No. 213,695, Dec. 29, 1971. This application Apr. 17, 1974, Ser. No. 461,774

Int. Cl. G06f *15/20*
U.S. Cl. 444—1
10 Sheets Drawing. 38 Pages Specification



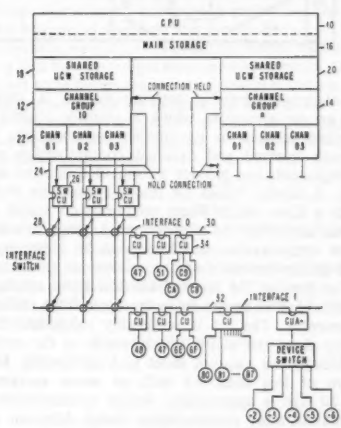
Apparatus and method for automatically generating a topology for a logic circuit to be embodied in a semiconductor wafer. Fixed data, designer originated data and control data are generated as an input to a computer. The fixed data provides electrical, and topological qualities of each logical element in the logic circuit to be embodied in the semiconductor wafer. The designer originated data provides location in an ordered grid layout. The control data describes (1) combinations of logical elements in the logic circuit by type of combination, start and end in the grid array descriptive of the semiconductor wafer and (2) electrically common combinations. A program employs the fixed, designer originated and control data to generate coordinate data for each logical element in the grid array as an input to a graphical processor which translates the coordinates into a topological pattern descriptive of the logic circuit to be embodied in the semiconductor wafer.

T940,021
INPUT/OUTPUT SYSTEM WITH CHANNEL GROUPS AND DYNAMIC SHARING OF I/O DEVICES

Paul J. Brown, Poughkeepsie, and Roger L. Carmier, Pleasant Valley, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of application Ser. No. 320,043, Jan. 2, 1973. This application June 24, 1974, Ser. No. 482,539

Int. Cl. G06f *3/00, 15/20*
U.S. Cl. 340—172.5
6 Sheets Drawing. 24 Pages Specification



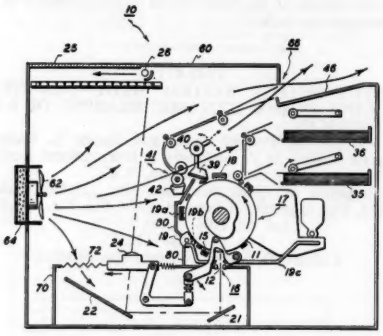
Apparatus for sharing input/output devices among a group of channels such that automatic path finding and dynamic sharing within the channel group is achieved. The system provides more efficient channel utilization with fewer system interruptions.

Any one channel of a group of similar channels, each of which has access to unit control words for a set of attached devices, performs I/O operations without program selection of a specific channel. With this type of an input/output system, a start I/O instruction specifies a channel group and a particular device so that any channel in the group that is not busy at the time the instruction is issued will execute the instruction.

Also disclosed is a unit control word structure that allows the number of unit control words assigned to a given I/O interface to be determined independently of the number of UCW's assigned to the other interfaces of

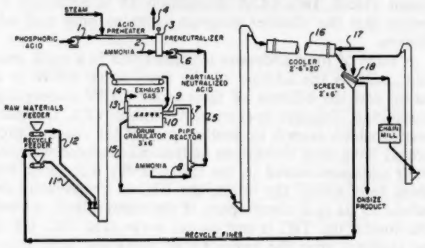
the system. It also allows shared sub-channel assignment to be determined independently of the device address structure. The UCW structure also allows sharing of UCW sets among channels to accommodate intreface sharing.

T940,022
PRESSURIZED AND FILTERED XEROGRAPHIC SYSTEM
John C. Rodda, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed June 26, 1974, Ser. No. 483,346
Int. Cl. G03g *15/00*
U.S. Cl. 355—3
1 Sheet Drawing. 11 Pages Specification



An electrostatographic copying system is contained within an air enclosure which is slightly positively air pressurized relative to its ambient surroundings to reduce both internal and external contamination of system components and provide a controlled internal air flow pattern. A blower blows air into the machine enclosure through a filter which filters contaminants which would otherwise contribute to photoreceptor image deletions. A separate optics system enclosure can be indirectly pressurized inside the main enclosure. An air shield is positioned to prevent the internal air flow from causing contaminants such as fumes from the fuser from striking the photoreceptor. The air is preferably exhausted through the copy sheet exit at the opposite side of the enclosure, and through the vacuum sheet pick-off system. Internal pressure of less than 0.1 inch of water sustained by about 20 cfm is appropriate. Amine contaminants causing selenium alloy photoreceptor image deletions are removed by filter materials such as activated charcoal or Hopcalite.

T940,023
PIPE REACTOR-CONTINUOUS AMMONIATOR PROCESS FOR PRODUCTION OF GRANULAR PHOSPHATES
Gordon C. Hicks, 3307 19th Ave., Sheffield, Ala. 35660, and Fred E. Lancaster, Jr., Killen, Ala. 35645
Filed Oct. 24, 1974, Ser. No. 517,452
Int. Cl. C05b *7/00*
U.S. Cl. 71—34
1 Sheet Drawing 13 Pages Specification



FLOW DIAGRAM OF GRANULATION PILOT PLANT USING PIPE REACTOR PROCESS FOR NPK FERTILIZERS

Process for production of granular mixed fertilizer in which ammonium phosphate melt is prepared in a pipe reactor and dispersed through a plurality of apertures in the wall of the pipe as a fine spray which serves to bind small particles of fertilizer materials into granules. Such fertilizer materials can include potassium chloride, single superphosphate, and urea, as well as others common to the industry. Wet-process orthophosphoric acid typically containing 54 percent P_2O_5 is ammoniated to an

$$NH_3:H_3PO_4$$

mole ratio of about 1.0 and the steam formed by the heat of reaction atomizes the ammonium phosphate melt very effectively, resulting in proper distribution of the melt for granulation of the small particles. The present invention is a result of a continuation of Meline's work in U.S. Pat. 3,733,191. A simple perforated pipe attached to the discharge end of the inline reactor results in effective disengagement of vapor from the melt and in much improved distribution of the ammonium phosphate melt, thereby further improving the process by eliminating the need for Meline's tube-and-rotor vapor disengager. Up to about 30 percent of the P_2O_5 in the melt may to polyphosphate. The melt may be ammoniated from an $NH_3:H_3PO_4$ mole ratio of 1.0 to about 1.2 or higher by addition of ammonia in the granulator. The ammonium phosphate is essentially anhydrous and the granules of mixed fertilizers do not require drying. Elimination of drying greatly decreases investment, dust and fume evolution, and fuel requirement.

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 28,600

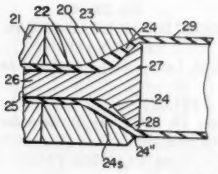
EXTRUSION DIE APPARATUS

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Original No. 3,587,281, dated June 28, 1971, Ser. No. 734,685, June 5, 1968. Continuation-in-part of Ser. No. 142,405, Oct. 2, 1961, Pat. No. 3,422,648, which is a continuation-in-part of Ser. No. 691,622, Oct. 2, 1957, Pat. No. 3,002,615, and reissued as U.S. Pat. No. Re. 25,570, Oct. 2, 1962, Ser. No. 228,223. Application for reissue June 25, 1973, Ser. No. 373,510

Int. Cl.[2] B21C *23/20*

U.S. Cl. 72—265 **20 Claims**



11. A variable extrusion apparatus comprising in combination:

a. an extruder having a die forming an extrusion material to a tubular shape and means for forcing said extrusion material through an opening in said die,

b. a mandrel extending through said die opening,

c. said mandrel being supported for longitudinal movement of said die opening,

d. said mandrel having a head portion connected to a base portion,

e. said mandrel and die opening being shaped whereby said head portion of said mandrel may engage a portion of the wall of the die to vary the shape of the annular volume between the die and mandrel,

f. means for moving said mandrel in said die opening, and

g. means for controlling movement of said mandrel during an extrusion cycle to bring the mandrel into and out of engagement with the wall of the die opening so as to vary the flow of extrusion material through said die.

Re. 28,601

METHOD AND APPARATUS FOR AUTOMATIC BALANCING OF MOTOR VEHICLE WHEELS

Dionys Hofmann, Darmstadt-Marienhohe, Germany, assignor to Dionys Hofmann, GmbH Maschinenfabrik, Germany

Original No. 3,748,910, dated July 31, 1973, Ser. No. 151,584, June 9, 1971. Division of Ser. No. 864,941, Sept. 23, 1969, Pat. No. 3,623,208, which is a continuation-in-part of Ser. No. 800,882, Feb. 20, 1969, abandoned. Application for reissue Sept. 25, 1973, Ser. No. 400,683

Claims priority, application Germany, Feb. 21, 1968, 77334

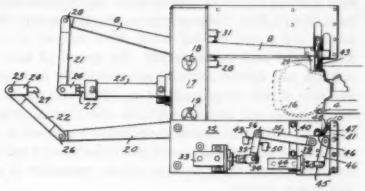
Int. Cl. G01m *1/38*

U.S. Cl. 73—468 **4 Claims**

1. In apparatus for automatically balancing a motor vehicle wheel, comprising a tire having two axially spaced tire beads pressed against two respective rim flanges of a wheel rim, including means for mounting said motor vehicle wheel horizontally for rotation about the vertical, longitudinal axis of the wheel at a predetermined speed; means for determining the amount and angular position of the weight require at one rim flange to, together with a balance weight holding clip, balance said wheel in the radial correction plane passing through said one rim flange and for determining the amount and angular position of the weight required at the other rim flange to, together with a balance weight holding clip, balance said wheel in the radial correction plane passing through said other rim flange, the improvement which comprises:

a holding clip inserting station adjacent said mounting means including means for temporarily forcing both tire beads away from the respective rim flanges at the locations of the aforementioned angular positions;

means for pushing a holding clip onto each rim flange at the location of said angular position on each rim flange, while the tire beads are forced away from the respective rim flanges at the locations of said aforementioned angular



positions, so that a first portion of each holding clip lies between the respective tire bead and the respective rim flange and a second portion of each holding clip overlies the exterior of the respective rim flange;

and balance weight form simulating means; means mounting said balance weight form simulating means for movement to between the lower of said rim flanges and the second portion of the holding clip to be pushed thereon, for preventing tilting misorientation of that holding clip during the period of distortion of the respective tire bead by said forcing means.

Re. 28,602

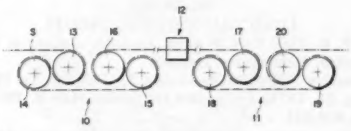
DIFFERENTIAL DRIVE FOR TENSION ROLLERS

Anthony Philip Clark, Oakville, Canada, assignor to B & K Machinery International Limited, Etobicoke, Canada

Original No. 3,764,050, dated Oct. 9, 1973, Ser. No. 226,739, Feb. 16, 1972. Application for reissue Oct. 23, 1974, Ser. No. 517,398

Int. Cl.[2] B65H *25/00*

U.S. Cl. 226—25 **14 Claims**



1. A tension roll assembly for a sheet metal working line and comprising:

first and second tension rolls about and between which a sheet metal strip runs;

a motive power source;

a first roll drive transmission operatively extending between said motive power source and said first tension roll to cause rotation of said first tension roll on operation of said motive power source;

a second roll drive transmission operatively extending between said motive power source and said second tension

roll to cause rotation of said second tension roll on operation of said motive power source;

a first differential including a main drive input, a main drive output and a control drive input, said first differential being operatively coupled in said second roll drive transmission to transmit drive motion from said motive power source to said second tension roll at a variable speed depending on the magnitude of the control drive to said first differential;

a first variable speed control motor operatively coupled to said control drive input of said first differential;

a first sensor coupled to said first tension roll and operative to provide an output signal indicative of the magnitude of a first roll parameter selected from the rotational speed and the shaft torque of said first tension roll, said first sensor also being operatively coupled to said variable speed control motor to cause variation in the speed of said control motor in response to variation in the magnitude of said first roll parameter, thereby automatically to adjust the speed of the main drive output of said first differential and consequently the speed of said second tension roll driven thereby automatically in response to variaton of the magnitude of said first roll parameter;

a third tension roll about which the sheet metal strip runs;

a third roll drive transmission operatively extending between said motive power source and said third tension roll to cause rotation of said third tension roll on operation of said motive power source;

a second differential including a main drive input, a main drive output and a control drive input, said second differential being operatively coupled in said third roll drive transmission to transmit drive motion from said motive power source to said third tension roll at a variable speed depending on the magnitude of the control drive to said second differential;

a second variable speed control motor operatively coupled to said control drive input of said second differential; and

a second sensor coupled to said second tension roll and operative to provide an output signal indicative of the magnitude of a second roll parameter selected from the rotational speed and the shaft torque of said second tension roll, said second sensor also being operatively coupled to said second variable speed control motor to cause variation in the speed of said second control motor in response to variation in the magnitude of said second roll parameter thereby automatically to adjust the speed of the main drive output of said second differential and consequently the speed of said third tension roll driven thereby automatically in response to variation in the magnitude of said second roll parameter.

Re. 28,603

LOAD TRANSMITTING STRUTS

Glyn P. R. Farr, Leek Wooton, England, assignor to Girling Limited, Birmingham, England

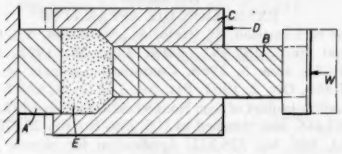
Original No. 3,750,853, dated Aug. 7, 1973, Ser. No. 173,953, Aug. 23, 1971. Application for reissue Mar. 8, 1974, Ser. No. 449,544

Claims priority, application United Kingdom, Aug. 21, 1970, 40422/70; Mar. 17, 1971, 7071/71

Int. Cl. F16d *65/54*

U.S. Cl. 188—196 R **24 Claims**

23. A load transmitting strut, comprising a variable volume chamber having two end walls constituting load bearing faces and formed respectively on two separate load transmitting members which are movable towards and away from each other, a mass of fluent granular material filling the chamber, a third member movable relative to the end walls to vary the configuration of the chamber and means for urging the third member so to move, the arrangement being such that the application of a thrust force to one load transmitting member and a corresponding reactive force to the other causes the granular mass to compact and to bear frictionally against the third member so that the three members are locked against relative movement, and that upon relieving the first member of the thrust force,



movement of the third member causes the spacing of the load bearing faces to be varied.

Re. 28,604

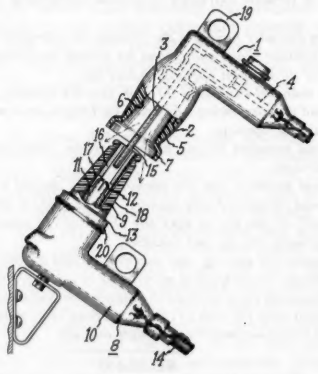
GAS SHIELD FOR LOAD-BREAK CABLE TERMINATIONS

Edward J. Kotski, Lenox, Mass., assignor to General Electric Company

Original No. 3,587,035, dated June 22, 1971, Ser. No. 856,671, Sept. 10, 1969. Application for reissue Mar. 5, 1975, Ser. No. 555,385

Int. Cl.² H01R *13/52*

U.S. Cl. 339—111 **8 Claims**



1. A voltage-grading termination module comprising an insulating housing having an electrical conductor mounted therein to form an electrical circuit through the housing from a first point adjacent one end thereof to a second point adjacent another end thereof, means defining a recess in said housing around the electrical conductor at said one end thereof, an annular flange of insulating material disposed entirely around the outermost peripheral edge of said recess and projecting outwardly and away from the end of said conductor in the recess thereby to form a gas confining shield around said end of the conductor, and a coating of electrically conductive material mounted on the outer surface of said housing to cover substantially the entire area thereof up to but not including the outer surface of said flange, said recess being generally frusto-conical in shape with its large diameter end abutting the innermost end of said flange thereby to form a gas confining chamber and shield arrangement that operates to direct arc-generated gas in a direction away from said coating, said end of said conductor being operable to engage and disengage a second electrical conductor and to form a gas-generating arc between itself and said second conductor during such engaging and disengaging operations, said gas confining shield being effective to prevent such arc-generated gas from forming a conductive path between either of said con-

ductors and said coating [.], *said annular flange comprising an integral part of said insulating housing.*

Re. 28,605

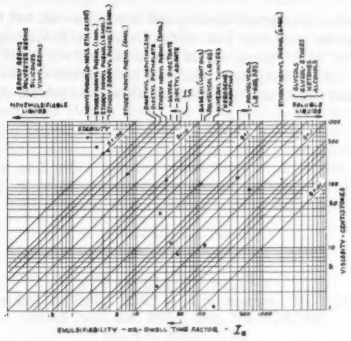
PENETRANT INSPECTION PROCESS AND COMPOSITIONS

James R. Alburger, 5007 Hillard Ave., La Canada, Calif. 91011

Original No. 3,311,479, dated Mar. 28, 1967, Ser. No. 492,676, Oct. 4, 1965. Continuation-in-part of Ser. No. 254,487, Jan. 28, 1963, abandoned. Application for reissue Feb. 25, 1970, Ser. No. 14,252

Int. Cl.[2] C09D *11/00, 11/02*

U.S. Cl. 106—19 **42 Claims**



22. An inspection penetrant liquid for detecting surface-connected defects, said penetrant liquid consisting essentially of a solvent and at least one dye dissolved in said solvent, said solvent consisting of at least one member selected from the group consisting of

a. a normally liquid solvent of the generic formula

$$\left[R\right]\begin{matrix}-x\\-y\end{matrix}$$

in which R is naphthalene and each of x and y is an alkyl radical containing from one to three carbon atoms,

b. a normally liquid solvent of the generic formula

$$\left[R\right]\begin{matrix}-x\\-y\end{matrix}$$

in which R is phthalate (or isophthalate) and each of x and y is an alkyl radical containing from six to 10 carbon atoms,

c. a normally liquid solvent of the generic formula

$$\left[R\right]\begin{matrix}-x\\-y\end{matrix}$$

in which R is saturated dicarboxylate, where the number n of the CH_2 radicals in the dicarboxylate nucleus is in the approximate range of 0–34, and each of x and y is an alkyl radical containing from six to 10 carbon atoms,

d. a normally liquid solvent of the generic formula

$$\left[R\right]\begin{matrix}-x\\-y\end{matrix}$$

in which R is phenol and each of x and y is an alkyl radical containing from eight to 12 carbon atoms,

e. a normally liquid solvent of the generic formula

$$\left[R\right]\begin{matrix}-x\\-y\end{matrix}$$

in which R is phenol, x is an alkyl radical containing from eight to 12 carbon atoms, and y is an ethoxy group containing from zero to 5 mols of ethylene oxide per mol of R, and

f. a normally liquid solvent of the generic formula

$$\left[R\right]\begin{matrix}-x\\-y\end{matrix}$$

in which R is 4.5-epoxy-tetrahydrophthalate and each of x and y is an alkyl radical containing from six to eight carbon atoms,

said solvent being present in said inspection penetrant liquid in a weight concentration within the approximate range of 2 to 98 percent, sufficient to provide an emulsification coefficient smaller than 50.

Re. 28,606

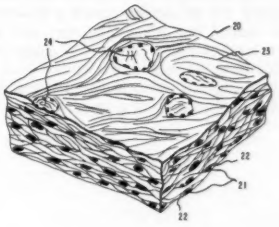
FILLED, BIAXIALLY ORIENTED, POLYMERIC FILM

Richard Masayoshi Ikeda, Chadds Ford, Pa., and George Joseph Ostapchenko, Wilmington, Del., assignors to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Original No. 3,738,904, dated June 12, 1973, Ser. No. 157,367, June 28, 1971. Application for reissue Aug. 31, 1973, Ser. No. 393,586

Int. Cl.[2] B32B *3/00;* **D01D** *5/12;* **D06N** *7/04*

U.S. Cl. 428—155 **18 Claims**



15. A biaxially stretched thermoplastic film consisting of:

A. a cellular polymer matrix prepared from a polymer having a crystallinity of at least about 60 at room temperature taken from the group consisting of homopolymers, copolymers, and blends thereof, of α-olefins having two to ten carbon atoms, having dispersed therein

B. about 26 to 50 weight percent of an inert inorganic filler, based on the weight of polymer and filler, having an average particle size of about 0.3 to 8 microns;

wherein the filled polymer has an elongation of at least about 1000 at a temperature within the range which is above the line-drawing temperature and below the melting temperature of the polymer, said film having a void content of at least about 30 to 70, an elongation at break at 22°C. of at least about 8 in each direction of stretch, an oxygen permeability of about 900 to 10,000,000 cc./100 sq. in./24 hrs./atmosphere/mil and about two to 40 surface ruptures per square millimeter.

Re. 28,607

PBX IN-DIALING

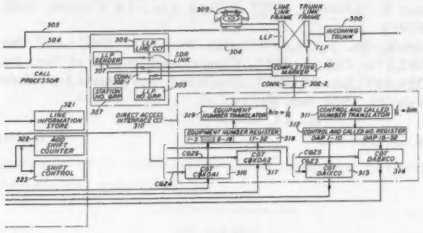
Philip Charles Richards, Geneva, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Original No. 3,479,467, dated Nov. 18, 1969, Ser. No. 588,379, Oct. 21, 1966. Application for reissue Nov. 1, 1971, Ser. No. 194,719

Int. Cl.[2] H04Q *3/54*

U.S. Cl. 179—18 ES **7 Claims**

1. A telephone switching system comprising a central office having a marker-controlled switching network, a plurality of telephone stations at a remote switch unit, a plurality of trunks connecting said switch unit with said central office switching network, a stored program control unit for exchanging control information with said switch unit to establish communications



connections among said stations and trunks thereat, and translator means including said control unit for furnishing the marker of said central office switching network with the [central office equipment location] *identification* of an idle one of said trunks serving called telephones at said switch unit.

PLANT PATENTS

GRANTED NOVEMBER 4, 1975

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,797
PLUM TREE
Frederic W. Anderson, Merced, Calif., assignor to The Burchell Nursery, Inc., Modesto, Calif.
Filed Dec. 23, 1974, Ser. No. 536,015
Int. Cl. A01h *5/03*
U.S. Cl. Plt.—38 **1 Claim**

1. A new and distinct variety of plum tree, substantially as illustrated and described, which is large, vigorous, upright to spreading, open, foliated with medium size, ovate leaves having a crenate margin, blooming with medium size, white flowers, and a regular and very productive bearer of large to medium, uniform size, symmetrical, globose, semi-freestone fruit, of very good to excellent eating quality, having yellow skin substatially entirely overspread with red, and yellow flesh; the tree, which blooms about with the Santa Rosa and bears late-ripening fruit, being characterized—in comparison to the Casselman—by heavier and more regular production of fruit, the latter having a brighter red color, fewer growth cracks and other fruit defects, and ripening a few days later.

3,798
STRAWBERRY PLANT
Herschel L Boll, R.R. 4, Champaign, Ill. 61820
Filed Nov. 18, 1974, Ser. No. 524,762
Int. Cl. A01h *5/03*
U.S. Cl. Plt.—48 **1 Claim**

1. A new and distinct variety of strawberry plant substantially as herein shown and described, characterized by its high productivity even on very poor soil, its vigorous growth, its early season of maturity, and its large fruit that is medium dark red in color.

3,799
PERPETUAL FLOWERING CARNATION PLANT
Giacomo Nobbio, Duca degli Abruzzi 85, San Remo, Italy
Filed Nov. 19, 1974, Ser. No. 525,316
Claims priority, application Italy, May 17, 1974, 51,083/74
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—73 **1 Claim**

1. A perpetual flowering carnation of the class having a generally closed calyx characterized in that the first plant of this variety was obtained by artificial fertilization of flowers of the variety called "Davide" with pollen from another unpublished hybrid variety with red flowers classified under the number "6627," said plant having the following unique combination of characteristics:

a. from the physical standpoint: a plant that grows to an average height of 100–120 cm. from the ground, tall and slender, with dense and compact vegetation, a thin and erect tuft, with numerous long, thick, sturdy, erect, rigid, straight or slightly sinuous flower branches; having abundant foliage of average size, fleshy and resistant; having elegant and most harmoniously shaped flowers, very double, with guard petals slightly falling back onto the calyx, giving the corolla a slightly globular appearance, with a large calyx of the closed type, and a very large little calyx compared with the calyx; having a regular, round corolla of a color between Blood Red and Cardinal Red, of a special tone;

b. from the physiological standpoint: a plant that is resistant to cryptogamic disease and inclemency of weather, is hardy for industrial production; that has abundant flowers and is productive in all seasons; suitable for cultivation in the open air or under glass; which has flowers that are resistant to inclemency of weather and to transport, suitable for export, which last well when cut, slightly or not at all scented; and the flowers and other parts of the plant being suitable for reproduction by agamic means.

3,800
MINIATURE ROSE PLANT
Ralph S. Moore, 2519 E. Noble Ave., Visalia, Calif. 93277
Filed Dec. 9, 1974, Ser. No. 530,723
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—8 **1 Claim**

1. A new and distinct variety of miniature rose plant of hardy, relatively dwarf, rounded, much branched, bush-type, as illustrated and described, characterized by buds and flowers resembling the Yellow Doll (Plant Pat. 2,450) miniature rose in general form of bud and flower, the color being a lighter shade of yellow and the petals tending to be broader and less numerous; the general color effect being soft yellow—of a shade resembling the Yellow Necklace miniature rose (not patented); and further characterized by a plant which is vigorous in growth but more compact in habit than Yellow Doll, easy to propagate from cuttings; with small medium green foliage, often tinted reddish on new growth; with flowers borne singly or several to stem.

PATENTS

GRANTED NOVEMBER 4, 1975

ERRATA

For CLASS	See PATENT NO.
073–023.1	3,916,465
428–457	3,916,506
052–489	3,916,577
052–167	3,916,578
024–073 P	3,916,703
092–086	3,916,771
137–002	3,916,926
139–122 R	3,916,935
280–150	3,917,023
192–045	3,917,036
123–193 P	3,917,133
299–008	3,917,326
415–125	3,917,437
208–059	3,917,562
208–131	3,917,564
208–144	3,917,565
208–293	3,917,566
209–138	3,917,567
209–144	3,917,568
210–021	3,917,569
423–415 P	3,917,663
423–472	3,917,671
423–607	3,917,716
264–041	3,197,761
427–068	3,917,794
313–272	3,917,968
357–024	3,918,070

PATENTS

GRANTED NOVEMBER 4, 1975

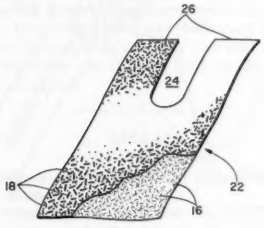
NOTE – A cross reference listing of applications published under Trial Voluntary Protest Program on January 28, 1975 is located in the back of this Issue. These entries will be in numerical order by document publication number.

GENERAL AND MECHANICAL

3,916,446
CHIN CUP AND CHIN STRAP FOR PROTECTIVE HEADGEAR
Elwyn R. Gooding, 120 Darwin Road, Pinckney, Mich. 48169
Filed Apr. 23, 1973, Ser. No. 353,317
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.[2] A42B *3/00*
U.S. Cl. 2—3 R **4 Claims**

1. A chin cup and strap assembly for a helmet comprising a cup assembly consisting of a pair of sections of double knit fabric positioned in face-to-face engagement and secured at the edges thereof, said sections being stretchable in a plurality of directions so as to be readily conformable to the chin of a wearer, said sections being longer in one direction than in another direction, and stretchable straps secured to said sections so as to extend away therefrom in said longer direction.

3,916,447
LOW COST, ABSORBENT, CLINGING, AQUEOUS LIQUID BARRIER PROTECTIVE COVERING
Lenore E. Thompson, Menasha, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Filed Apr. 24, 1972, Ser. No. 247,116
Int. Cl.[2] A47C *31/10, 31/11;* **A45D** *44/08*
U.S. Cl. 2—46 **2 Claims**



1. In combination, a fabric garment containing natural fibers and a protective cover attached to said fabric garment, the improvement wherein said protective cover is of interbonded, multi-layer construction having as a first surface in contact with said garment, a layer substantially composed of generally discontinuous, thermoplastic, hydrophobic microfibers having an average fiber diameter of from about 2 microns to about 6 microns and a basis weight in the range of from 0.5 to 30 grams per square meter and, as an exposed second surface, a layer having a basis weight of from about 10 to 60 grams per square meter substantially composed of absorbent cellulosic fibers,

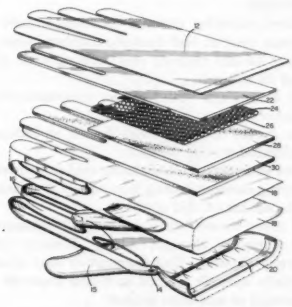
said protective cover having aqueous liquid barrier properties and a tendency to cling to said fabric garment and resist displacement during normal use.

2. In combination, an article of furniture having a fabric outer material containing natural fibers and a protective cover attached to said fabric,

the improvement wherein said protective cover is of interbonded, multi-layer construction having as a first surface in contact with said fabric, a layer substantially composed of generally discontinuous, thermoplastic, hydrophobic microfibers having an average fiber diameter of from about 2 microns to about 6 microns and a basis weight in the range of from 0.5 to 30 grams per square meter and, as an exposed second surface, a layer having a basis weight of from about 10 to 60 grams per square meter substantially composed of absorbent cellulosic fibers,

said protective cover having aqueous liquid barrier properties and a tendency to cling to said fabric and resist displacement during normal use.

3,916,448
PROTECTIVE GLOVE
John S. Hamel, 49 Holt Road, Andover, Mass. 01810
Filed Mar. 3, 1975, Ser. No. 554,911
Int. Cl.[2] A41D *19/00*
U.S. Cl. 2—161 R **11 Claims**



1. A protective glove comprising:

a. a hand-shaped hollow outer glove shell having finger portions and a thumb portion;

b. a flat, relatively flexible, solid layer of metal-containing material inserted into said hollow outer glove shell, said metal-containing material extending from adjacent to the cuff portion of said outer glove shell to the fingertip portion of said outer glove shell;

c. at least one flat, flexible layer of metal wire mesh material inserted into said hollow outer glove shell, said wire mesh material extending from adjacent to the cuff portion of said outer glove shell to at least the upper finger portion of said outer glove shell;

d. at least one flat, flexible, resilient layer of cushioning material inserted into said hollow outer glove shell, said cushioning material extending from adjacent to the cuff portion of said outer glove shell to at least the upper finger portion of said outer glove shell; and

e. a correspondingly hand-shaped hollow inner lining inserted into said hollow outer glove shell, said inner lining extending from adjacent to the cuff portion of said outer glove shell to the fingertip portion of said outer glove shell, said inner lining and said at least one layer of cush-

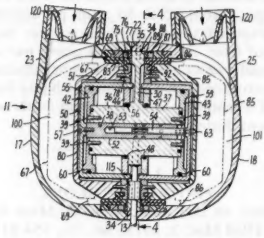
ioning material and said metal-containing material layer all being fastened to said hollow outer glove shell only at the cuff portion thereof, said inner lining being positioned between the palm side of said outer glove shell and said layer of cushioning material.

3,916,449

IMPLANTABLE HEART PUMP

Paul Knight Davis, Alemeda, Calif., assignor to Pacific Roller Die Co., Inc., Hayward, Calif.

Continuation of Ser. No. 312,668, Dec. 6, 1972, abandoned. This application Nov. 19, 1974, Ser. No. 525,131
Int. Cl.[2] A61F *1/24*
U.S. Cl. 3—1.7 **18 Claims**



1. A heart pump, comprising:
a. a housing;
b. a blood pumping element mounted in said housing for opposed systolic and diastolic displacement relative to a portion of said housing and defining with said portion a blood chamber;
c. inlet means and outlet means communicating with said chamber;
d. drive means in said housing having an independent, predetermined driving period;
e. means substantially associating said drive means with said pumping element during said period for effecting systolic displacement of said element; and
f. said drive means being substantially disassociated from said pumping element during diastolic displacement, whereby diastolic displacement of said element is substantially directly related to blood pressure and volume presented at said inlet means.

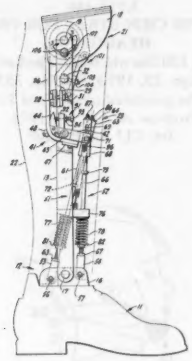
3,916,450

SIMPLIFIED ARTIFICIAL LEG STRUCTURE WITH ARTICULATED KNEE JOINT

Orval L. Minor, 1220 Tasman Drive, No. 306, Sunnyvale, Calif. 94086

Filed Mar. 6, 1975, Ser. No. 555,850
Int. Cl.[2] A61F *1/04*, *1/08*
U.S. Cl. 3—25 **5 Claims**

1. An improved artificial leg comprising:
an artificial foot,
a lower leg pivotally connected to said artificial foot at an ankle joint,
an upper knee element adapted for connection to the upper leg of a person and having a cylindrical portion with a pair of circumferential grooves thereabout,
a knee joint shaft secured across the upper end of said lower leg portion through the cylindrical portion of said upper knee element for rotatably mounting said upper knee element to define a knee joint,
a pair of tension belts disposed one in each circumferential groove in said upper knee element with a first end of each belt secured to said lower leg beneath said knee joint,
a cam element pivotally mounted on said lower leg below said knee joint and having the second end of said belts connected thereto, and



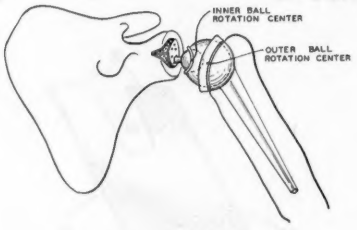
a pair of spring-loaded actuators pivotally mounted on said foot one ahead of and one behind said ankle joint and extending into engagement with said cam element for pivoting the cam upon pivoting of the ankle joint to thereby tighten said belts about said upper knee element and lock said knee joint.

3,916,451

FLOATING CENTER PROSTHETIC JOINT

Frederick F. Buechel, 127 Short Hills Road, Apt. 159, West Orange, N.J. 07052, and Michael J. Pappas, 209 Park Place, Irvington, N.J. 07111

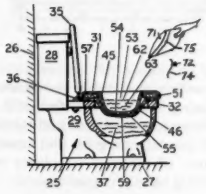
Filed Oct. 25, 1974, Ser. No. 518,161
Int. Cl.[2] A61F *1/24*
U.S. Cl. 3—1.91 **17 Claims**



1. An improved prosthetic joint comprising:
a. floating bearing means having portions defining a first floating bearing surface which has a cross section conforming to a first circular arc;
b. the floating bearing means having portions defining a second floating bearing surface which has a cross section conforming to a second circular arc;
c. a first member having portions defining a first anchor means for being secured to a first bone;
d. the first member having portions defining a first bearing means for rotatably engaging the first bearing surface of the floating bearing means, thereby permitting relative motion of the first member and the floating bearing means about a first center of rotation;

e. a second member having portions defining a second anchor means for being secured to a second bone;
f. the second member having portions defining a second bearing means for rotatably engaging the second bearing surface of the floating bearing means, thereby permitting relative motion of the second member and the floating bearing means about a second center of rotation;
g. wherein the first center of rotation is offset from the second center of rotation.

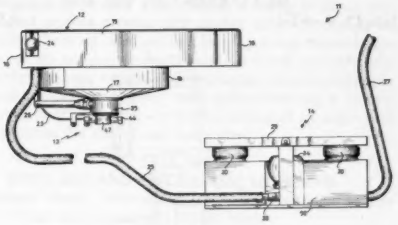
3,916,452
DISPOSABLE SANITARY, COLLAPSIBLE BIDET
Rudolph Alt, 39 Merrimack St., Methuen, Mass. 01844
Filed Mar. 11, 1974, Ser. No. 449,942
Int. Cl.² A47K *3/22, 11/08*
U.S. Cl. 4—6 **12 Claims**



1. In combination with a conventional hinged toilet seat
a disposable, sanitary, collapsible enclosure for temporarily converting said hinged toilet seat into a bidet, or sitz bath, said enclosure comprising:
an envelope of limp, flexible, water-impervious sheet material having two opposite side walls with closed side edges, a closed end and an open end;
said open end being of predetermined width and said side walls being of predetermined width and length to loosely, slidable fit over the envelop said conventional toilet seat and to cover the hole therein;
one side wall thereof overlying said hole and the other side wall underlying said hole;
the loose fit and limpness of the material of said envelope causing the two walls thereof, superposed across said hole, to sag and form a depression therein constituting a two-ply receptacle adapted to receive and support liquid, said envelope entirely covering said seat, when slidably fitted thereover, so that no part of the human body touches said seat.

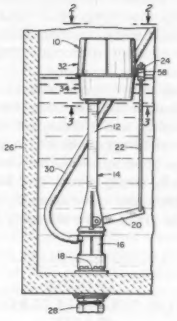
3,916,453
PORTABLE BIDET
Pedro Dominguez-Armada, Rio de La Magdalena 130, Mexico 20, D.F., Mexico
Filed Nov. 28, 1973, Ser. No. 419,743
Claims priority, application Mexico, June 4, 1973, 143870
Int. Cl.² A47K *3/22, 11/08*
U.S. Cl. 4—7 **14 Claims**

1. Portable bidet adaptable to toilet bowls comprising an open container constituted by side and bottom walls, one of said side walls being slightly tapered and having a rounded top edge and said bottom wall including an orifice for providing and draining water into and from said open container; a plate comprising a section with a multiplicity of small openings and a drainage slot, which plate covers said orifice of said bottom wall; a valve coupled to said open container fixed to said bottom wall registering with said plate comprising a perforated section and a drainage slot; a sliding lever coupled to one of said side walls of said open container, which sliding lever is also coupled to said valve; a pump attached to said open container for establishing a flow of water from a water tap into said open container; and flexible connections for



coupling said pump to said open container and said pump to said water tap.

3,916,454
FLOAT FOR BALL COCKS AND THE LIKE
Adolf Schoepe, 1620 N. Raymond Ave., Fullerton, Calif. 92631, and Fredric E. Schmuck, 535 Century Drive, Anaheim, Calif. 92805
Filed Jan. 2, 1974, Ser. No. 429,736
Int. Cl.² E03D *1/34;* **F16K** *33/00*
U.S. Cl. 4—56 **14 Claims**

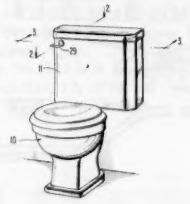


1. In a float of the type for use with ball cocks and the like in controlling the water level in tanks; the combination of: a body having a hollow interior including an upper part partially downwardly telescoping over a lower part with said lower part spaced inward of said upper part forming a generally annular water inlet therebetween opening into said body hollow interior; said body hollow interior extendig into said body lower part forming a ballast chamber in communication with said water inlet; a tubular air vent extending downwardly through said body interior having a lower end opening into said body interior intermediate said body vertical height and an upper end opening outwardly of said body spaced above said water inlet, a maximum generally horizontal cross section of an interior of said tubular air vent being equal to only a small portion of an average generally horizontal cross section of said body hollow interior; said body hollow interior being formed as a closed chamber other than said water inlet and said tubular air vent lower end.

3,916,455
TOILET FLUSH TANK APPARATUS

Harry W. Longdin, 1111 Bright St., Jonesboro, Ga. 30236

Filed Dec. 24, 1974, Ser. No. 536,192
Int. Cl.[2] E03D *1/34, 5/10, 1/22*
U.S. Cl. 4—67 A 6 Claims



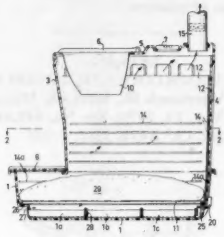
1. A flushing apparatus comprising an upstanding fixed guide member adapted to be secured to the bottom of a flush tank at the discharge opening means thereof, the guide member having a head on its upper end forming a stop, first and second flush valve assemblies arranged in stacked relationship on the guide member and each having internal guide fingers slidably contacting the guide member, each valve assembly having a lowermost valve element and an attached upwardly extending overflow pipe section, said fingers formed integral with said overflow pipe sections and projecting radially inwardly of their side walls, the valve element of the lower assembly adapted for seating on a seating means near the bottom of a flush tank, the top of the lower overflow pipe section forming a seat for the upper valve element of the upper assembly, a common operating handle for the apparatus adapted for pivotal mounting on a flush tank, a first lever secured to the handle and extending above said lower assembly, a first flexible element interconnecting the first lever and the lower valve assembly, a second lever pivoted to the first lever and extending above the second valve assembly, a second flexible element interconnecting the second lever and second valve assembly, and a spring interconnecting the first and second levers yieldingly, whereby depression of the handle by a user of the apparatus will first unseat the upper valve assembly to partially empty a tank and further depression of the handle while the upper valve assembly is engaged with said stop will unseat the lower valve assembly to complete emptying of a tank.

3,916,456
CONTAINER FOR THE MOULDERING OF ORGANIC WASTE

Nils Christer Persson, Ostersund, Sweden, assignor to Inventor AB OPE, Ostersund, Sweden

Continuation of Ser. No. 242,395, April 10, 1972, abandoned. This application Mar. 19, 1974, Ser. No. 452,518
Claims priority, application Sweden, Apr. 16, 1971, 4961/71
Int. Cl.[2] A47K *11/03*
U.S. Cl. 4—131 1 Claim

1. A container for moulderable organic waste, comprising two side walls, a front wall, a rear wall, a bottom and an upper wall having a least one filling opening, a closure for said filling opening, a grate supported on and within said container above said bottom wall to support said moulderable material and to successively release mouldered material through the grate so that said material can be collected, said grate comprising a plurality of parallel metal tubes disposed in parallel side by side relation which at their ends are interconnected and form a continuous loop that extends across the bottom of the container substantially from said front wall to said rear wall and substantially from one of said side walls to the other of said side walls, an electrically insulated electric heating wire disposed in and extending along said tube from end to end thereof, an air inlet through one of said walls below said grate, a ventilation pipe extending from the upper portion of the container, an electrically operated air fan in said ventilation pipe for exhausting air and gases from said container, a corrosion-resistant housing comprising a tubular sleeve of polyvinyl

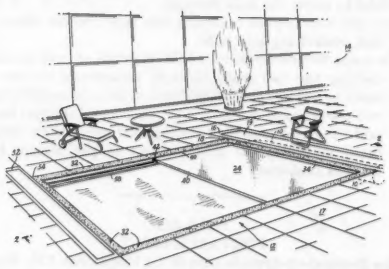


chloride surrounding said tube, the power of said electric heating wire being between 50 and 300 watts, thereby to maintain a surface temperature of said tube in the range of 40° to 105°C., and means resting on and covering the grate and providing a layer of material supplying microorganisms to initiate mouldering of said organic waste.

3,916,457
SYSTEM FOR MAINTAINING ACCEPTABLE ENVIRONMENTAL CONDITIONS IN AN INDOOR SWIMMING POOL ENCLOSURE

Akio Morita, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Division of Ser. No. 207,154, Dec. 13, 1971, Pat. No. 3,748,664. This application Jan. 5, 1973, Ser. No. 321,261
Int. Cl. E04h *3/16, 3/18*
U.S. Cl. 4—172.12 3 Claims



1. A device for preventing evaporation of water in an indoor pool when the pool is not in use, comprising a flexible laminate of water impervious material formed of:

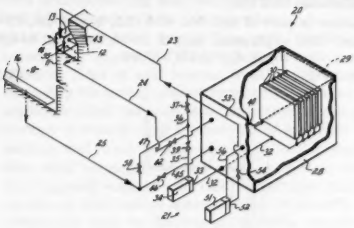
A. a layer of bouyant foamed plastic material; and

B. a thinner layer of water impervious plastic material, said layers being adhesively joined together, surface to surface to form a flexible, said laminate having the same general peripheral configuration as the pool and being shaped to cover and float upon substantially the entire surface of water in the pool, thereby preventing evaporation of the water in the pool; said foamed plastic layer being formed of foamed polyethylene and said thinner impervious layer being formed of a thin film of polyethylene; said layers being joined together in superimposed relation.

3,916,458
SWIMMING POOL CIRCULATION SYSTEM

John F. Ogden, Columbus, Ohio, assignor to Lifetime Metal Products, Inc., Columbus, Ohio

Filed May 9, 1974, Ser. No. 468,426
Int. Cl.[2] E04H 3/20
U.S. Cl. 4—172.17 8 Claims



1. In a recirculating system for swimming pools having a filter, a gutter for return of water to the filter, a main drain connected to said filter, a conduit forming at least a portion of a wall between the gutter and the pool, and pump means for circulating water from said filter to said pool, the improvement comprising,

a plurality of one-way valves on the pool side of said conduit directing flow of water from said conduit into said pool,

a plurality of one-way valves on the gutter side of said conduit drawing water from said gutter into said conduit, and means for selectively:

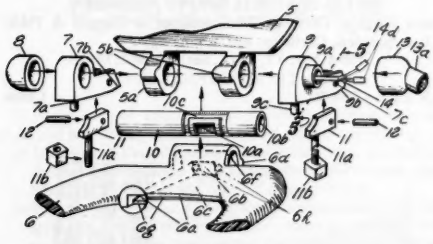
a. circulating water from said filter to said conduit, pool and main drain with water returning to said filter, and

b. circulating water from said filter to said main drain and pool, the water from the pool overflowing into said gutter and being returned to said filter via said conduit.

3,916,459
TOILET VENTILATING APPARATUS IN KIT FORM

Marko Ivancevic, 423 N. Broadway, Redondo Beach, Calif. 90277

Filed Apr. 19, 1974, Ser. No. 462,400
Int. Cl.[2] E03D 9/04; A47K 13/00
U.S. Cl. 4—213 8 Claims



1. In combination with a toilet and a lavatory, said toilet having a toilet bowl and a toilet seat, said toilet seat being pivotally connected by pivot means to said toilet bowl, said lavatory having a liquid drain pipe, a toilet ventilating apparatus comprising:

air duct means connected to said toilet seat;

air conduit means connected to said air duct means;

air blower means having an air inlet and a air outlet, said air inlet connected to said air duct means, said air outlet connected to said lavatory liquid drain pipe, whereby said air blower means is to draw air by suction from within said toilet bowl through air duct means and through said air conduit means and into said lavatory liquid drain pipe;

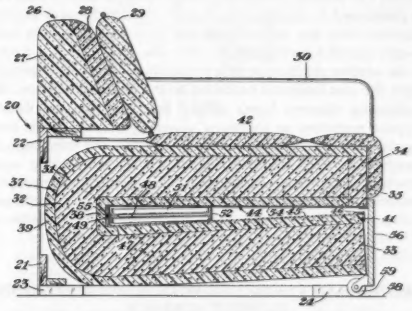
means connected to said toilet seat for causing said toilet seat to assume a canted position with respect to the rim of the said toilet bowl when said seat is in the at rest position;

said means includes an axle, said seat being pivotally mounted upon said axle, said axle being fixed to connected anchor means, said anchor means including an anchor bearing, said anchor bearing being movable between an and upper position and a lower position, said anchor bearing being under a constant bias to said upper position, whereby when said anchor bearing is in said upper position said toilet seat is canted at an angle with respect to the rim of said toilet bowl.

3,916,460
SOFA BED AND MECHANISM THEREFOR

M. Fillmore Harty, Bloomfield Hills, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 30, 1974, Ser. No. 537,307
Int. Cl.[2] A47C 17/10
U.S. Cl. 5—13 15 Claims



9. A convertible couch, the convertible couch having a frame, the frame having a front and a rear, a cushion element positioning assembly and a foldable cushioning element, the assembly comprising a first positioning means which permits the folded cushioning element to be moved from the back of the frame toward the front of the frame, the first positioning means comprises a four-bar linkage including a base member, the base member having pivotally affixed thereto first and second generally parallel arms, a pivot assembly plate pivotally affixed to the first and second arms to provide a generally parallelogram four-bar linkage, a stop means to limit movement of the first positioning means in a direction toward the front of the frame, at least four cushioning element support members of generally planar configuration, the cushioning element support members being first, second, third and fourth members, the first support member being pivotally affixed to the positioning means by a pivot means, the second support member being pivotally affixed in generally edge to edge relationship with the first support member, the pivot means comprising a first pivot arm pivotally affixed to the pivot assembly plate, a second pivot arm pivotally affixed to the plate, the first pivot arm being pivotally affixed generally in a region of the first arm, a second pivot arm pivotally affixed to the plate at a location closer to the base member than the point of pivotal attachment of the second arm to the plate, the first pivot arm and second pivot arm being pivotally affixed to the first support member at a location generally remote from the point of pivotal attachment to the second support member to form a second four-bar linkage wherein the four bars consist of a portion of the pivot assembly plate, the first and second pivot arms being generally spaced apart and in the sleeping configuration, the first and second pivot arms forming a cross, in the seating configuration the third support member being hinged or pivotally affixed to the second sup-

port member at a location remote and generally parallel to the attachment to the first support of the second support member, the fourth support member pivotally attached to the third support member at a location parallel to and generally remote from the attachment of the third support member to the second support member, the first, second and third support members being foldable to a configuration closely approximating the dimension of either the first or fourth support member, the second and third support members being disposable between opposed major faces of the first and fourth support members on folding, the second and third support members being pivotally attached to each other at a location about midway along their length, the end of the second support member remote from its location of pivotal attachment to the first support member being pivotally affixed to a first link arm which is in turn affixed to a location on the fourth support member remote from its point of pivotal attachment to the third support member and that the end of the third support member remote from its point of pivotal attachment to the fourth support member is pivotally affixed to a second link arm which is pivotally attached to the first member at a location remote from its point of pivotal attachment to the second support member to thereby form a lazy tongs configuration which can be positioned to dispose first, second, third and fourth support members and first and second link arms in a generally side-by-side parallel configuration when the mechanism is folded in the seating position or in a generally colinear arrangement when the mechanism is extended to the sleeping position, the cushioning element being affixed adjacent first and fourth support members at locations generally remote from their regions of hinged attachment to the second and third support members respectively, the cushioning element being compressible and having a major surface remote from the support element which has a length approximating the combined widths of the first, second, third and fourth support elements.

3,916,461

ARTICLE OF FURNITURE WITH A MULTI-SECTION SUPPORT SURFACE

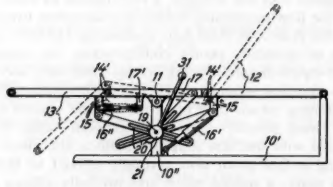
Fritz Kerstholt, Leun, Germany, assignor to Gerdi Kerstholt geb. Spath and Fritz Kersthott

Filed Feb. 11, 1974, Ser. No. 441,175

Claims priority, application Germany, Feb. 14, 1973, 7305571; Mar. 9, 1973, 2311640; Apr. 5, 1973, 7312840; Apr. 26, 1973, 7315769

Int. Cl.[2] A61G *07/10*; A47C *03/32*

U.S. Cl. 5—66 **26 Claims**



1. An article of furniture comprising a base frame and a plurality of support members providing a multi-section support surface for a user reclining on the article, said support members including a middle section pivotably mounted at the middle portion thereof on bearings relative to the base frame and first and second end sections mounted pivotably at a first end and a second end of said middle section on bearings at inner ends of said end sections for movement of said end sections through different open angles relative to said base frame and said middle section and at least one section connected by at least one spring support system said base frame and said end sections having stop means for locking said end sections in desired positions relative to said base frame without being braced by another support member.

3,916,462

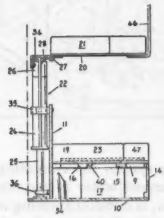
MECHANISM FOR CONVERTING A COUCH INTO AN UPPER AND LOWER BED

George Henry Riches, 170 Roehampton Ave., Toronto, Ontario, Canada M4P1R2

Continuation-in-part of Ser. No. 454,912, March 26, 1974, abandoned. This application Aug. 5, 1974, Ser. No. 494,968

Int. Cl.[2] A47C *17/40*

U.S. Cl. 5—9 R **5 Claims**



1. In a convertible sofa having a hollow base, a fixed back and a vertically reciprocatable seat back movable between a couch forming position and elevated horizontal bed forming position and in which in the couch forming position the bottom portion of the seat back is stored in the base, means for raising the seat back to the horizontal bed forming position and lowering it to the couch forming position comprising a power operated jack having a vertically reciprocatable jacking member with a travel sufficient to lift the portion of the seat back stored in the base clear of the top of the base, an upper stabilizing member slidably securing the jack to the fixed back midway between the lateral ends of the seat back to thereby retain the jacking member in a vertical position during its up and down travel, and lifting members connected to the vertically reciprocatable jacking member and hingedly connected to the seat back adjacent the top edge thereof.

3,916,463

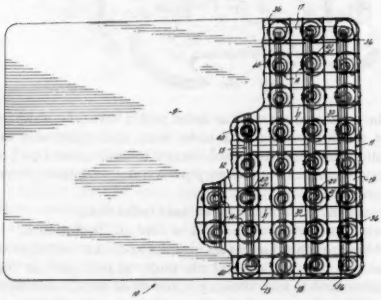
METAL SLAT BOX SPRING ASSEMBLY

Larry Higgins, Carthage, Mo., assignor to Leggett & Platt, Incorporated, Carthage, Mo.

Filed Apr. 17, 1974, Ser. No. 461,745

Int. Cl.[2] A47C *23/02*, *23/04*

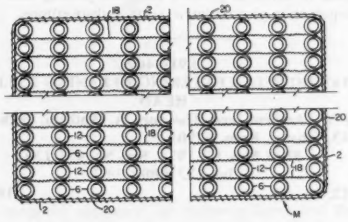
U.S. Cl. 5—264 R **1 Claim**



1. A box spring assembly comprising

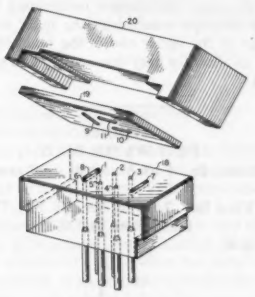
a generally rectangular bottom frame,
a plurality of spaced parallel cross slats extending between and connected to opposite sides of said rectangular bottom frame,
a plurality of helical springs each terminating at one end in a generally planar lower round and at the opposite end in a generally planar upper round,
means interconnecting and securing said upper rounds of said helical springs in a common plane,
each of said slats being formed from metal shaped to define transversely spaced flat bottom surfaces resting upon said opposite sides of said bottom frame and a transversely extending rib having opposed spaced side walls and a top surface located between said flat bottom surfaces, and
connector means formed in said ribs of said slats for connecting said lower rounds of said helical springs to said slats, said connector means comprising slots formed in said opposed walls of said ribs of said slats, said bottom rounds of said helical springs being frictionally secured within said slots by forcing said bottom rounds of said helical springs away from the adjacent helical round as said bottom round is inserted into a slot and by maintaining said bottom and adjacent rounds of said spring under stress with said bottom round physically contacting said slot and the adjacent round physically contacting said top surface of said rib.

3,916,464
PRE-STRESSED SPRING MATRIX
Stephen Tyhanic, 7761 E. Oxford Ave., Denver, Colo. 80237
Filed Apr. 11, 1974, Ser. No. 459,916
Int. Cl.² A47C *23/02, 23/00*
U.S. Cl. 5—351 **10 Claims**



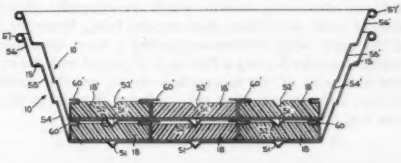
1. A pre-stressed spring matrix for use in innerspring mattress and box spring construction, said matrix comprising:
at least one high coil spring having a first base at one end thereof and a second base at the other end thereof, said bases each being in the form of a convolution;
at least one low coil spring positioned adjacent said high coil spring in side by side relationship thereto, said low coil spring having a first base at one end and a second base at the opposite end, said bases each being in the form of a convolution, with the first base thereof lying in substantially the same plane as the first base of the high coil spring with the respective convolutions of said bases in contiguous relationship therewith;
a first connecting means connecting the convolution of said first base of said high spring to an adjacent portion of the convolution said first base of said low spring; and
a second connecting means connecting said convolution of said second base of said high spring to an adjacent portion of the convolution of said second base of said low spring placing said high spring in compression and said low spring under tension so that both springs are pre-stressed in opposite directions.

3,916,465
MULTI-STREAM GAS CHROMATOGRAPHIC METHOD AND APPARATUS
A. William Jones, Wilson, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.
Continuation-in-part of Ser. No. 301,032, Oct. 26, 1972, Pat. No. 3,800,602. This application Mar. 11, 1974, Ser. No. 449,820
The portion of the term of this patent subsequent to Apr. 2, 1991, has been disclaimed.
Int. Cl. G01N *1/22*
U.S. Cl. 73—23.1 **8 Claims**



7. A programming valve comprising
a. a valve block member having six ports and at least one channel,
b. a movable valve plate member positioned on one face of said member being movable relative to the valve block member between two positions, whereby:
in a first position each valve plate channel provides communication between two ports of the valve block; and
in a second position two valve plate channels provide communication between two valve block ports through a valve block channel while a third valve plate channel provides communication between two valve block ports.

3,916,466
STACKABLE BOAT
Samuel L. Davidson; William C. Heidenreich, and Phillip Hunter, all of Monroe, La., assignors to Delhi Manufacturing Corporation, Delhi, La.
Filed May 10, 1974, Ser. No. 469,029
Int. Cl.² B63B *7/02*
U.S. Cl. 9—2 S **12 Claims**



1. A boat comprising a hull and at least one seat, said hull being elongated and having a bow end and a stern end, said hull including a bottom and opposed sides extending upwardly and outwardly from said bottom, at least one elongated strake formed in each of said sides, each of said strakes including inwardly extending portions defining a shoulder, each of said seats being elongated and including an upper sitting surface and opposed end portions adapted to be supported by the horizontal surface of said shoulders on opposite sides of said hull with the elongated dimension of said seats extending transversely across said hull in use, and with flotation means

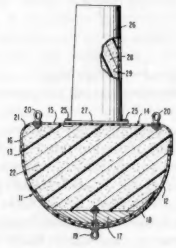
being carried by said seats beneath said sitting surface, said bottom of said hull and said seats being dimensioned such that said seats are adapted to rest on said bottom of said hull with said elongated dimensions of said seats extending longitudinally of said hull during storage and shipping whereby a plurality of said hulls may be nested to minimize space, said seats being formed with an upper and lower elongated section, each of said sections carrying flotation means, and including brackets which extend around the top and side portions of said upper section and at least partially around the bottom and side portions of the lower section, the brackets of the upper seat section having a lower end and the brackets of the lower seat section having an upper end, each of the lower ends of the brackets of the upper seat section terminating in a horizontal flange which slidingly mates with the inner surface of a U-shaped flange at the upper end of the brackets of the lower seat section to allow for easy disassembly and storage of each of said seats.

3,916,467

FAST WATER BUOY

Robert F. Curd, Jr., Fort Marshall, Sullivans Island, S.C. 29482

Filed Nov. 7, 1974, Ser. No. 521,776
Int. Cl.[2] B63B *21/52*
U.S. Cl. 9—8 R **3 Claims**



1. A buoy particularly for use in fast currents of water comprising a roughly hemispherical flotation body portion having a closed plastic shell and an internal core of flotation material, a ballast element inside of the shell at the bottom of said body portion, a buoy mooring element at the bottom of the body portion and centrally disposed and engaged with the ballast element and serving to anchor the same within said shell, an intermediate spherically curved plastic liner intervened between said shell and ballast element in the lower portion of the shell, said closed plastic shell comprising upper and lower telescoping sections which are integrally joined by a solvent weld, said lower shell section being hemispherical and the upper shell section comprising a short substantially cylindrical section having a flat top wall joined with the cylindrical side wall of the top section by an annular rounded shoulder, and an upstanding visual marker secured to the top of the body portion centrally.

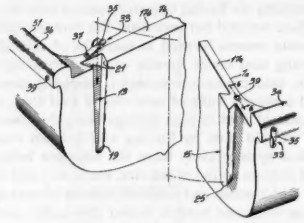
3,916,468

SECTIONAL CANOE

Yves E. Tetreault, 12, rue St-Antoine Sud; Leonard Arcouette, 326 Mountain, and Serge Cadorette, 184, Dufferin, all of, Granby, Quebec, Canada

Filed Apr. 8, 1974, Ser. No. 459,002
Int. Cl.[2] B63B *7/04*
U.S. Cl. 9—2 S **7 Claims**

1. A boat comprising:
a. at least two separate, shape-retaining sections;
b. each section including a transversely disposed, vertical wall, each wall including a top edge and a bottom edge, said bottom edge being coterminus with a bottom surface of the boat;
c. said vertical walls including means for connecting said sections together;
d. said connecting means including a plurality of narrow, elongated, vertical wedge-shaped slots in one of said vertical walls, each slot having sides converging in a downward direction from the top of said one vertical wall;
e. each slot terminating in a bottom end, said end being spaced from the bottom edge of said one vertical wall;



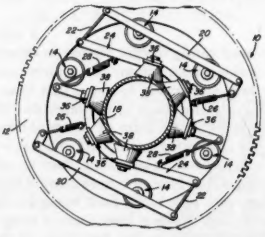
f. said connecting means also including a plurality of narrow, elongated, vertical, projecting wedges in the other of said walls, each wedge having sides converging in a downward direction from the top of said other wall;
g. each wedge terminating in a bottom tip, said tip being spaced from the bottom edge of said other wall;
h. said wedges cooperating with said slots to join said sections together in end-to-end relationship such that said walls are held together contiguously to form a bulkhead in said boat;
i. said tips of said wedges abutting said bottom ends of said slots to serve as positive stops for joining said sections together in given relative vertical dispositions.

3,916,469

FLOATING SELF-CENTERING CLEANING CYLINDER HEAD

Clyde W. Anthem, and Theodore A. Anthem, both of Box 1443, Liberal, Kans. 67901

Filed May 17, 1974, Ser. No. 471,130
Int. Cl.[2] B08B *9/02*
U.S. Cl. 15—88 **16 Claims**



1. A floating self-centering head subassembly for rotational pipe and tube cleaning heads, comprising, in combination:
a. a retaining arm mountable on a support portion of a cleaning head;
b. a movement arm rotatably mounted on the retaining arm;
c. a floating self-centering arm rotatably mounted on the movement arm; and
d. biasing means for pulling the floating self-centering arm against an article to be cleaned, the floating self-centering arm including, in combination:

i. a longitudinal rotating arm having longitudinally spaced ends and rotatably mounted on the movement arm at a one of the ends;

ii. at least one brush holder connected to the rotating arm between the spaced ends of the arm; and

iii. a pull arm affixed to the other of the ends of the rotating arm and connected to the biasing means.

3,916,470

FLOOR MOPPING APPLIANCE

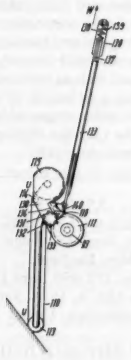
Rudolf May, Possinger Strasse 24, Berlin 49, Germany

Filed Nov. 8, 1972, Ser. No. 304,666

Claims priority, application Germany, Nov. 12, 1971, 2157104; Oct. 4, 1972, 2249187

Int. Cl. A47l *11/26, 13/144, 13/60*

U.S. Cl. 15—98 **4 Claims**



1. A mopping appliance for mopping floors and the like comprising: elongate handle means; mopping roller means mounted at one end of the handle means; absorbent mop means extending around at least part of the periphery of said mopping roller means to be supported thereby such that a portion of said mop means is adapted to engage a floor or like working surface backed up by said mopping roller means, whereby when said appliance is drawn backward and forward across the floor said portion of said mop means is drawn backwards and forward in contact with the working surface to mop the working surface; spring drive means operatively coupled to advance said mop means; intermittent means operatively positioned for selectively locking said mop means and holding the mopping roller means against rotation during the mopping operation and advancing said mop means, said intermittent means being comprised of a double pawl engaging a ratchet wheel connected with said mopping roller means; and means operatively coupled for, during working strokes of said appliance, releasing said intermittent means to intermittently advance said mop means by said spring drive means during the mopping operation irrespective of the friction between said mop means and the floor and the pressure of the appliance on the floor, to bring a previously unused portion of said mop means into the position occupied by said first-mentioned portion of said mop means for engagement with the working surface.

3,916,471

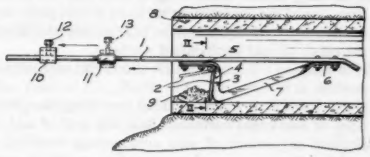
CULVERT CLEANING TOOL

Charles O. Maze, Angelica, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed June 10, 1974, Ser. No. 477,641

Int. Cl.² B08B *9/02*

U.S. Cl. 15—104.3 R **1 Claim**



1. A culvert cleaning tool, comprising

an elongated rod-like handle;

a shovel-type plate hingedly affixed to the handle and movable from a plane substantially parallel and adjacent to the handle to a plane substantially perpendicular to the handle;

a support member affixed to the handle and having a part extending substantially perpendicularly from the handle and next-adjacent the plate when the plate is in its position substantially perpendicular to the handle for preventing the plate from moving beyond its perpendicular position, said support member comprising

an angle iron twisted to have a pair of spaced substantially linear end parts affixed to the handle, a first intermediate part extending substantially perpendicularly from one of the end parts and a second intermediate part extending from the other of the end parts to the outermost end of the first intermediate part and inclining therebetween; and

a pair of collars slidably positioned on the handle and releasably securable in desired positions via bolts, the bolts being positioned to indicate the position of the plate on the circumference of the handle and the collars being releasably secured at points on the handle indicating how far into a culvert the plate is.

3,916,472

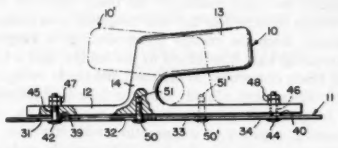
TROWEL FOR APPLYING ADHESIVES

William E. Carder, Fairport, N.Y., assignor to Carder Industries, Inc., Rochester, N.Y.

Filed Jan. 29, 1974, Ser. No. 437,658

Int. Cl.² B05C *11/04*

U.S. Cl. 15—235.6 **6 Claims**



1. A trowel for spreading adhesives and the like, comprising a plate having a pair of spaced side edges for spreading an adhesive material on a surface,

a handle mounted on said plate releasably and selectively in one of two different operating positions in which a handgrip portion thereof overlies opposite ends, respectively, of said plate,

releasable clamping means for fixing said handle against movement relative to said plate, when said handle is in one of its operating positions,

cooperating latching means on said plate and said handle, respectively, engageable releasably to hold said plate on said handle, when said clamping means is released,

said plate and said handle being shiftable relative to each other in opposite directions selectively to effect engagement and disengagement, respectively, of said cooperating latching means, when said clamping means is released,

said latching means comprising at least one pin projecting from one of the confronting surfaces of said plate and said handle, respectively, and into at least one slot formed in the other of said confronting surfaces,

said slot having a narrow portion at one end and an enlarged portion at its opposite end,

said pin having an enlarged head overlying marginal portions of said other surface at said one end of said slot to prevent separation of said confronting surfaces, when said handle is in one of its operating positions, and said head registering with and being passable through said enlarged portion of said slot to permit separation of said confronting surfaces, when said plate and said handle are shifted relative to one another out of an operating position, and

said other confronting surface having portions thereof adjacent the juncture of the narrow and enlarged portions of said slot projecting out of a plane of said slot and operative resiliently to secure said plate between said handle and the head of said pin, when the handle is in one of its operating positions.

3,916,473
WIPER FOR WINDSHIELDS

Zelmer L. Williams, Issaquah, Wash., assignor to H.A.S. Investments, Inc. (Entire), Lacey, Wash.

Filed Feb. 25, 1974, Ser. No. 445,224
Int. Cl.² B60S 1/46
U.S. Cl. 15—250.04 **7 Claims**

1. A windshield wiper assembly, comprising, in combination:

a. an arm assembly;

b. means provided on the arm for mounting same on a wiper arm support head;

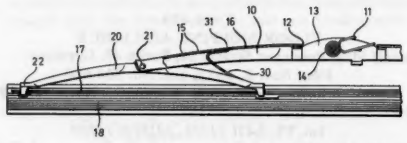
c. a blade assembly mounted on said arm assembly; and

d. means associated with the arm assembly for supplying a fluid to the blade assembly, the blade assembly including a bridge attached to the arm assembly at a point thereof spaced from the means for mounting, a longitudinally extending base connected to the bridge, and a longitudinal blade connected to the base, the blade being arranged extending longitudinally with the base and provided with a longitudinal groove arranged adjacent the base for forming a gutter in cooperation with the base, and an aperture provided in the base substantially midway in the longitudinal extent thereof and arranged for permitting communication with the groove, a plurality of passages provided in the blade and arranged spaced along the longitudinal extent of the blade for permitting a fluid to pass to a windshield from the gutter formed by the groove and base, and the bridge extending longitudinally along and having spaced end portions connected to the base, with the bridge provided with a jog arranged for circumventing the aperture in the base and facilitating placement of a portion of the means for supplying the fluid to the blade assembly.

3,916,474
WIPER BLADE SUPPORT CONSTRUCTION

Alfred Kohler, Bietigheim, Germany, assignor to SWF-Spezialfabrik fur Autozubehor Gustav Rau GmbH, Germany

Filed Apr. 8, 1974, Ser. No. 458,687
Int. Cl.² B60S 1/04
U.S. Cl. 15—250.42 **6 Claims**

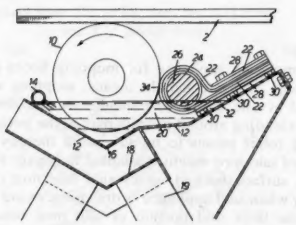


1. A wiper blade support suitable for use in supporting a wiper blade on vehicles, comprising a main yoke adapted to be connected intermediate its length to a wiper arm, at least one connecting yoke pivoted intermediate its ends on said main yoke and having respective ends with means thereon for engaging a wiper blade, and an auxiliary support spring adjustable connectable between said main yoke and said connecting yoke between an end of said connecting yoke and its pivotal connection to said main yoke and biasing aid connecting yoke away from said main yoke, said support spring comprising a flat spring having one end with an outwardly extending projection, said main yoke having a plurality of longitudinally spaced recesses, said projection being engageable in a selected one of said recesses in order to vary the biasing force between said main yoke and said connecting yoke.

3,916,475
SUPPORT ROLL CLEANING DEVICES

Ernest Wilford, Bingley, England, assignor to Associated Weavers Limited, Yorkshire, England

Continuation of Ser. No. 371,450, June 19, 1973, abandoned.
This application Oct. 4, 1974, Ser. No. 512,400
Claims priority, application United Kingdom, June 30, 1972, 30073/72
Int. Cl.² B41F 9/12; D21G 3/02
U.S. Cl. 15—256.51 **6 Claims**



1. In a carpet printing apparatus, a carpet support roller cleaning device for continuously cleaning a rotating carpet support roller which supports a moving carpet at a first location on said roller surface, comprising;

means for applying a liquid to said roller surface at a second location on said roller surface,

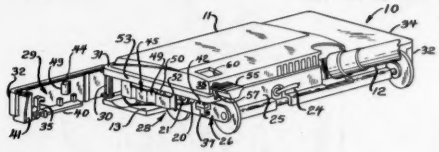
brush means including support engaging means, said brush means engaging said roller surface at a location, in the direction of roller rotation, between said second and first locations, respectively, for removing said liquid from said roller surface and, support means for said brush means, carrying said support engaging means, said support means comprising a planar member, sloping downward toward said roller to urge said brush means against said roller surface by the weight of said brush means.

3,916,476

VACUUM CLEANER HOUSING STRUCTURE

Milton J. Johnson, Rosemount, and Paul M. Clark, St. Paul, both of Minn., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jan. 16, 1974, Ser. No. 433,919
Int. Cl.[2] A47L 9/04
U.S. Cl. 15—377 14 Claims



6. In a vacuum cleaner having a rotary brush, a motor, and a belt for driving the brush from the motor, housing structure comprising:

wall means enclosing said brush, motor, and belt and defining an access opening providing access to said belt for removal and installation thereof, said motor and brush being provided with belt pulley means rotatable about horizontal parallel axes, said opening providing access to said belt in alignment with said axes whereby said belt may be moved from and to said pulleys through said access opening in a direction parallel to said axes for facilitated removal and installation thereof;

guide means removably disposed within said access opening for maintaining said belt against movement outwardly from the pulley means in a direction parallel to said axes; and

a door hingedly connected to said wall means for selectively closing and exposing said access opening, said door overlying said belt guide means in the closed position of the door across said access opening.

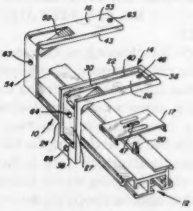
9. The vacuum cleaner housing structure of claim 6 wherein means are provided on said housing for movably mounting said guide means to permit selective disposition of the guide means substantially outwardly of said access opening for permitting free access to said belt, and means are further provided on said housing for selectively retaining said guide means in a belt guiding disposition outwardly adjacent said belt on said pulley means.

3,916,477

DRAPERY SUPPORTING BRACKET

George H. Baker, Sr., Peoria, Ill., assignor to Baker Drapery Corporation, Peoria, Ill.

Filed Feb. 15, 1973, Ser. No. 332,712
Int. Cl.[2] A47H 1/04
U.S. Cl. 16—94 D 13 Claims



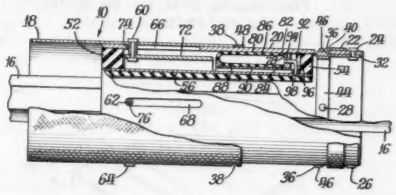
1. A bracket assembly for a drapery traverse track, comprising, a generally L-shaped plastic body member having a generally vertical leg and a generally horizontal leg, an abutment surface formed on one of said legs, an L-shaped metal member having a generally vertical leg and a generally horizontal leg, said metal member interfitting with said plastic member for rigidifying the plastic body member, and a brace formed integral with one of said legs of said metal member and having a free end extending angularly toward the other of said legs of said metal member, said free end of said brace engaging with said abutment surface on the one leg of said plastic member for additional support.

3,916,478

VIBRATION ISOLATING GRIP FOR PNEUMATIC HAND TOOLS

Daniel Bronson Shotwell, Washington, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 15, 1974, Ser. No. 470,203
Int. Cl.[2] A47J 45/08; B25G 1/12
U.S. Cl. 16—116 R 25 Claims



1. A vibration isolating and heat insulating hand grip for a power driven, manually manipulated impact tool which has a shank that mounts in a chuck, said grip comprising, in combination:

a rigid, tubular shell of non-porous material which is adapted to surround a tool shank and is open at both ends;

a compliant, non-porous sleeve within said shell, said sleeve being open at both ends and being large enough that a tool shank extends loosely therethrough, said sleeve having only its end portions bonded to the end portions of the shell, and said shell and sleeve defining an inflatable annular chamber;

a cylindrical vibration damping and heat insulating housing surrounding the shell, the dimensions of said housing being such that it may be readily gripped by a human hand;

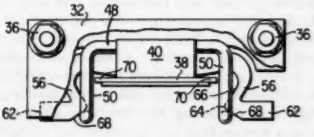
and means operatively associated with said shell for inflating said chamber so the compliant sleeve firmly grips the tool shank, and for deflating said chamber to release said compliant sleeve from the tool shank.

3,916,479

HINGE AND DETENT MECHANISM

Howard W. Parker, Westboro, and Arlon G. Sangster, Sterling, both of Mass., assignors to Jamesbury Corporation, Worcester, Mass.

Filed Dec. 13, 1974, Ser. No. 532,603
Int. Cl.[2] E05D 11/08
U.S. Cl. 16—142 8 Claims



1. A hinge and detent assembly comprising:

frame means for providing a supporting structure,

bearing means fastened to said frame means for providing a pivot for said hinge,

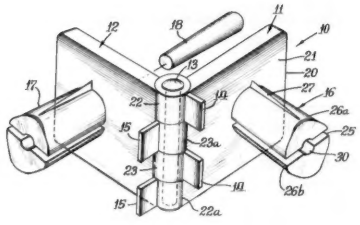
a hinge arm movably coupled to said bearing means,

over-center spring means secured to said frame means for applying biasing forces to said hinge arm, said over-center spring means including at least a first resilient leg portion having oppositely inclined camming surfaces thereon for engaging said hinge arm, said camming surfaces separated by a nose portion for providing an over-center action in the biasing forces supplied by said spring means.

3,916,480
FACE MOUNTED HINGE

Lester L. Smith, 5151 Mission Hills Drive, Tucson, Ariz. 85718

Filed Aug. 28, 1974, Ser. No. 11,382
Int. Cl.² E05D *5/02, 9/00*
U.S. Cl. 16—159 **3 Claims**

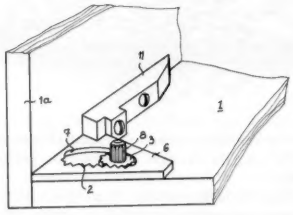


1. A face mounted hinge assembly for use in pivotally interconnecting folding doors and the like, comprising: a pair of identical, unitary molded plastic hinge leaf elements, each leaf element comprising a body portion having a planar guide surface engageable with a planar door face on which it is mounted, a substantially cylindrical mounting plug portion, integral with said body portion and extending perpendicularly from said guide surface for insertion into a cylindrical walled mounting socket formed inwardly of said door face; and a pair of coaxially aligned cylindrical hub portions formed integrally with said body portion at spaced positions along one linear edge thereof and lying non-interferingly out of the plane of said guide surface; said hub portions having coaxial openings therethrough; the said linear edges of a said pair of leaf elements being aligned in opposed adjacency in assembly, with said hub portions thereat coaxially interleaved in registering alignment; a hinge pin, definitive of the hinge axis for said assembly, mounted in said axial openings and thereby pivotally interconnecting the leaf elements; guide means aligned with said hinge axis and comprising coplanar surfaces for engaging opposing lateral edges of a pair of doors interjoined by the hinge assembly whereby to uniformly space such door edges and align the assembly on said doors; each said plug portion having a central smooth walled opening extending through its said body portion and communicating with a single, lengthwise extending slot medially dividing said body portion into semi-cylindrical portions; and elongated anchor pin means insertable into the central opening of each said plug portion to effect controlled separation of its said semicylindrical portions transversely of said slot and directionally parallel to said hinge axis whereby to frictionally anchor the same against the walls of its associated said mounting socket.

3,916,481
FURNITURE HINGE

Willi Pittasch, Herford, Germany, assignor to Firma Richard Heinze GmbH & Co. KG, Herford, Germany

Filed Jan. 3, 1975, Ser. No. 538,279
Claims priority, application Germany, Jan. 21, 1974, 2402667
Int. Cl.² E05D *3/06, 3/08, 3/10;* **E05D** *14/52*
U.S. Cl. 16—166 **12 Claims**



1. A furniture hinge for mounting a furniture door member on a furniture body member comprising a hinge bracket adapted to be attached to one of said members, said bracket including a flat flange defining an elongated, interior slot having spaced teeth extending into said slot from one interior edge of said slot to form a rack, a tooth wheel adapted to be attached to the other of said members for insertion into said flange slot, said tooth wheel having spaced teeth extending outwardly of and completely around said wheel for meshing engagement with said rack teeth to cause the tooth wheel to run along said elongated slot as said members are angularly displaced relative to one another about a pivot axis defined by the axis of said tooth wheel, the crown diameter of said tooth wheel being substantially equal in dimension to the width of said slot to maintain said teeth in meshing engagement with one another and to inhibit lateral movement of said tooth wheel relative to said slot, and said tooth wheel including an outstanding shoulder having a diameter greater than the width of said slot, said shoulder being positioned to bear against flat surfaces of said flange bounding the edges of said slot to inhibit relative axial movement between said tooth wheel and flange and to guide said tooth wheel as it runs along said slot.

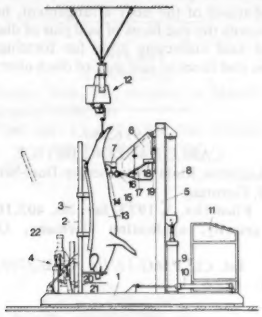
3,916,482
DEVICE FOR CLEAVING OF CARCASSES OF SLAUGHTERED ANIMALS

Vermund Kvilhaug, Gragasveien 17, 3140 Borgheim, Norway

Filed Jan. 30, 1974, Ser. No. 438,118
Int. Cl.² A22B *5/20*
U.S. Cl. 17—23 **4 Claims**

1. In a device for cleaving of carcasses of slaughtered animals, especially pig carcasses, by chopping, cleaving strokes with a sword like tool which parts the carcass, after the belly having been cut open in its longitudinal direction and the entrails having been removed, in two symmetrically equal halves, by which the backbone of the carcass is cleaved in the longitudinal direction, which tool is fixed to and protrudes from one end of the housing which comprises power transferring means which applies chopping movements to the tool and which thereby is moved downwardly along a vertical post, the carcass being supported by a stand which keeps the carcass in vertical position during the cleaving operation, the improvement comprising: the housing carrying a pair of free rotating casters which are arranged for contacting each side of the inner side of the backbone of the carcass to follow same, and a servo controller coupled to said casters to bring the tool to

move along the middle plane of the backbone which coincides with the distorted parting plane by turning said cutting tool



about a horizontal axis which substantially coincides with its edge.

3,916,483

APPARATUS FOR MANUFACTURE OF SKINLESS SAUSAGES

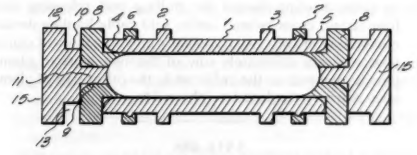
Isaac Vinokur, Av. Forest 1485, Buenos Aires, Argentina

Filed Oct. 7, 1974, Ser. No. 512,463

Claims priority, application Argentina, May 28, 1974, 253948

Int. Cl.[2] A22C *7/00*

U.S. Cl. 17—32 **16 Claims**



1. An apparatus for making skinless sausages, comprising a plurality of moulds respectively having open-ended elongated hollow shells linked together transversely of their length in an endless chain and having separable end heads and caps remaining fitted thereto during part of the travel of the chain and remaining separated therefrom during part of the travel of the chain, said shells having at least one pair of peripheral ridges, including a pair serving to seat link means for linking said shells in said chain;

means for intermittently advancing said chain in a cyclical path;

means embracing the sides of said chain at a first station thereof for filling said shells of said moulds with a sausage making paste;

means embracing the sides of said chain at a second station thereof for applying end heads to both ends of successive moulds, said end heads each comprising a plug for providing an end profile to the interior of said mould and a flange extending beyond to exterior of said shell of said mould when said plug is inserted in said shell, both said flange and said plug being pierced by an axial perforation;

means embracing the sides of said chain staggered lengthwise of said chain respectively at third and fourth stations thereof for applying caps to said end heads applied to said moulds, first on one end and then on the other of each mould, said caps having stem members fitting into said perforations of said end heads to complete the end profile of said mould and having a body with a flange spaced from the flange of the adjacent end head when the stem member is fully inserted;

means for removing said caps from said end heads at a fifth station of said chain;

means for removing said end heads from said shells at a sixth station of said chain;

means for conveying a succession of separate caps from the means at said fifth station to the means at said third and fourth stations;

means for conveying a succession of separate end heads from said means at said sixth station to said means at said second station;

means for cooking the contents of said moulds, said cooking means surrounding said chain over a portion of said cyclical path intermediate of said fourth and fifth station;

means for removal of cooked sausages adjacent said chain at a seventh station thereof intermediate of said sixth and first stations;

means for intermittently advancing said chain past said stations in above-numbered order, and

means for operating said means at said first, second, third, fourth, fifth, sixth and seventh stations in coordination with said advancing means.

3,916,484

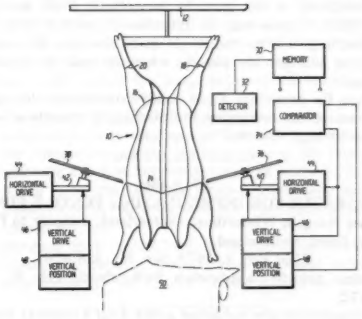
METHOD AND APPARATUS FOR AUTOMATIC CARCASS CUTTING

Raymond A. Kennedy, 3518 Stone Park Blvd., Sioux City, Iowa 51104

Filed Oct. 5, 1973, Ser. No. 403,821

Int. Cl.[2] A22C *17/00*

U.S. Cl. 17—52 **20 Claims**



1. A method for cutting animal carcasses which includes applying cut indicator designations directly to a carcass, moving said carcass suspended vertically from the upper end thereof past a plurality of spaced cutting stations and cutting said vertically suspended carcass at each said cutting station in accordance with said cut indicator designations by making spaced sequential cuts in said vertically suspended carcass at each said cutting station, said cuts beginning at the bottom end of the carcass and working upwardly.

3,916,485

STRAND SEPARATING AND STRIPPING APPARATUS

Ctibor Doudlebsky; Frantisek Jaros; Antonin Cap; Frantisek Ferka; Josef Ripka, and Jan Junek, all of Usti Nad Orlici, Czechoslovakia, assignors to Vyzkumny ustav bavlnarsky, Usti nad Orlici, Czechoslovakia

Filed Oct. 1, 1973, Ser. No. 402,202

Claims priority, application Czechoslovakia, Oct. 2, 1972, 6649-72

Int. Cl.[2] D01G *5/00*

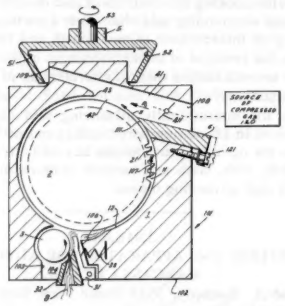
U.S. Cl. 19—65 R **5 Claims**

1. In a strand separating and stripping apparatus:

a housing having an internal bore and an elongated internal passage extending through the housing, the passage inter-

secting the bore to define an adjustable width strand stripping zone having first upstream and second downstream boundary edges, the passage including a wall section whose downstream end defines the first boundary edge and which is adjustably receivable by the housing to correspondingly adjust the stripping zone;

means for adjustably supporting said wall section for axial movement in said housing to correspondingly vary the width of the stripping zone;



a cylinder rotatably mounted within the bore and having a plurality of external comb elements disposed on the periphery thereof, said periphery being spaced from the periphery of the bore by an arcuate work space into which strands may be introduced, such strands being discharged from the work space through the stripping zone and into the passage when the cylinder is rotated; and

means for propelling a gas axially downstream through the passage for conveying the discharged strands at a relatively high velocity.

3,916,486

APPARATUS FOR IMPREGNATING TEXTILE FIBERS

Werner Naegeli, Winterthur, Switzerland, assignor to Pavena AG, Basel, Switzerland

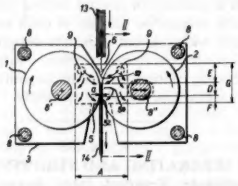
Filed Feb. 1, 1973, Ser. No. 328,870

Claims priority, application Switzerland, Feb. 9, 1972, 1886/72

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] D01B *3/04*

U.S. Cl. 19—66 R **18 Claims**



1. An apparatus for continuously impregnating with a liquid a textile fiber arrangement moving in a predetermined direction of travel, comprising a pair of rotatable discs having peripheral faces and end faces, two cover plates arranged at the region of the end faces of said pair of discs, said discs being arranged with said peripheral faces opposite to each other, including a liquid infeed opening in each of said cover plates, said liquid infeed openings, viewed in the direction of travel of the fiber arrangement, being located in front of a line connecting the axes of said pair of discs, said two cover plates together with said pair of discs forming a collecting zone into which impregnating liquid is delivered from said infeed openings of said cover plates, said cover plates, viewed in the direction of travel of the fiber arrangement, having portions inclined towards the end faces of said pair of discs and extending beyond said collecting zone for forming wedge faces covering the end faces of said pair of discs after the collecting zone.

3,916,487

CABLE HAULING DEVICE

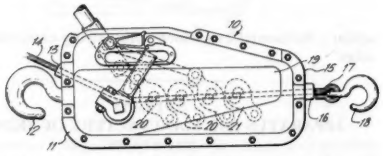
Johannes Augustus Rinio, Altenberger-Dom-Strasse 18, 5074 Odenthal, Germany

Filed Oct. 3, 1973, Ser. No. 403,166

Claims priority, application Germany, Oct. 6, 1972, 2249127

Int. Cl.[2] F16G *11/10;* **A01D** *37/02*

U.S. Cl. 24—122.6 **4 Claims**



1. In combination:

a. a four-strand cross-twisted cable wherein the four strands (**26**) of the cable (**14**) are twisted about a solid cable core (**27**) which has a substantially square-shaped cross-section and is practically non-compressible and

b. a cable hauling device for pulling and releasing said four-strand cross-twisted cable, said cable hauling device comprising at least two oppositely movable pairs of clamp jaws wherein alternately one of the two pairs of clamp jaws is clamped on the cable while the other pair of clamp jaws is freely displaced on the cable.

3,916,488

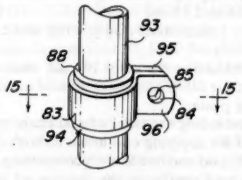
POLY-POLYMER PLASTIC DEVICE

Chester T. Gazda, Chicopee, and James M. Lalikos, Springfield, both of Mass., assignors to Titeflex, Springfield, Mass.

Continuation-in-part of Ser. No. 262,761, June 14, 1972. This application July 22, 1974, Ser. No. 490,393

Int. Cl.[2] A44B *21/00;* **C09D** *5/18;* **F16L** *3/08*

U.S. Cl. 24—262 R **21 Claims**



1. A cushioned abrasion resistant device comprising a metal strap shaped to have at least one bight, a scuff resistant cushion formed in at least the inside of the bight area of the strap, said scuff cushion comprising an ablative covering of a large volume of flame protective material which experiences a slow degradation of particles which carry off surface heat when subjected to flame, and said scuff cushion further comprising an admixture of a silicone-type polymer mixed with granulated sintered particles from the class of polytetrafluoroethylene and related fluoroplastic materials, said particles having

diameters in the general order of 0.001 inch to 0.015 inch, and said admixture of silicone polymer and particles being proportioned in the range of 25% to 75% by weight.

3,916,489

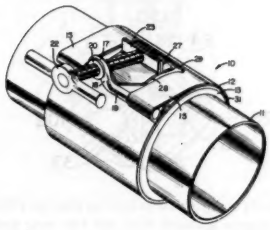
COUPLING

William L. Berger, Erie, Pa., assignor to Morris Coupling & Clamp Company, Erie, Pa.

Filed Apr. 22, 1974, Ser. No. 462,653

Int. Cl.[2] B65D *63/02*

U.S. Cl. 24—279 2 Claims



1. A coupling for a tube, pipe or the like comprising,
a tensioning band made up of flexible relatively thin flat material adapted to lay on the outside surface of a pipe or tube,
said tensioning band is disposed around a gasket,
said tensioning band having a notch formed in one end,
the ends of the material defining said notch having their ends rolled back forming eyelets,
a yoke having a curved intermediate part and two straight end parts,
said end parts being rotatably received in said eyelets,
a nut having one side fixed to the inside curve of the intermediate part of said yoke,
said two straight end parts extending outwardly from said intermediate part and being disposed on a line passing on the opposite side of said nut from said one side,
said nut receiving a screw,
a strike on the end of said band opposite said notch,
said strike comprising a piece of sheet material slightly narrower than said notch, and having an intermediate part thereof bent back on itself forming an outwardly extending portion extending generally radially of said coupling,
the ends of said strike resting on said band and extending from said outwardly extending portion a substantial distance and terminating short of the end of said band,
said strike having a seat found on said outwardly extending part adapted to engage an end of said screw,
said screw being adapted to be swung with said yoke to a position parallel to a diameter of said pipe and having the end of said screw engage said seat,
said screw being adapted to be swung to a position tangent to said pipe at said strike and said yoke disposed between a line passing through said screw parallel to the axis of said pipe and the outer periphery of said band whereby the said tensioning band is preliminarily tensioned,
said screw being adapted to be tightened by rotating said screw in said nut with said eyelets swung into engagement with said band whereby said tensioning band is tensioned and said coupling is held in closed position by toggle action of said screw and said yoke.

3,916,490

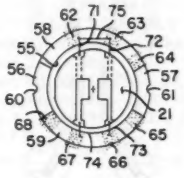
METHOD OF ASSEMBLY OF CRYSTAL FILTERS

Desmond F. Sheahan, San Carlos, and George C. Callander, Palo Alto, both of Calif., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Division of Ser. No. 285,989, Sept. 5, 1972, Pat. No. 3,832,761, which is a division of Ser. No. 156,275, June 24, 1971, Pat. No. 3,723,920. This application Apr. 17, 1974, Ser. No. 461,686

Int. Cl.[2] H01L *41/22*

U.S. Cl. 29—25.35 2 Claims



1. The method of fabricating stackable resonator assemblies, each assembly including a piezoelectric crystal body having a conductive pattern formed on each of the two opposing major faces thereof with overlapping body patterns and having lead patterns connected to the body patterns, the patterns being formed on the crystal faces with respect to a first reference point on the crystal faces by locating the crystal body on the circumference thereof and a dielectric frame having an opening therethrough for receiving the crystal body, having a second reference point thereon that is spaced from the opening, and having a plurality of metallic electrodes formed on the end of the frame adjacent the opening therethrough: comprising the steps of
placing a crystal body in the opening through an associated frame with the crystal spaced from the frame to expose the conductive patterns on both sides of the crystal,
positioning the first reference point on each crystal body which is in the opening in each associated dielectric frame to be at the same distance from the second reference point; and
positioning each crystal body in the opening to make the conductive patterns thereon have the same orientation with respect to the second reference point on the frame.

3,916,491

TENTER CLIP MACHINE FOR BIAXIALLY STRETCHING THERMOPLASTIC FILM

Herbert Kampf, Wiehl, Germany, assignor to Firma Erwin Kampf Maschinenfabrik, Wiehl, Germany

Filed Mar. 22, 1974, Ser. No. 453,614

Claims priority, application Germany, Mar. 23, 1973, 2314533

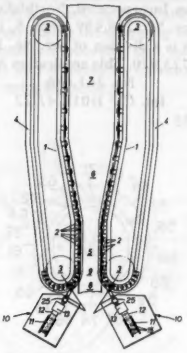
Int. Cl.[2] D06C *3/00*

U.S. Cl. 26—57 R 3 Claims

1. In a tenter clip type stretching machine for receiving and gripping thermoplastic film in an entering section having spaced-apart tenter clips successively arranged along a processing section at either side thereof, said clips each being provided with a gap to retain a section of the marginal edge of the film, means for advancing said tenter clips and for increasing the spacing therebetween in a longitudinal direction with respect to said film, guide path means for said tenter clips for transversely stretching said film which is retained by said tenter clips by movement of the latter on said guide path means, the improvement comprising:
feeder means disposed adjacent to the entering section and including a payoff device receiving a supply spool for containing a cover strip, said feeder means for dispensing a channel-shaped edge cover strip having two legs into

the gap of each tenter clip of a processing section so that the cover strip encompasses the respective marginal edge of the film with the two legs protruding over said respective film marginal edge of the film, as the tenter clip is ready to grip the film; and

means for closing said tenter clips for gripping said film and cover strip after placement thereon.



3,916,492

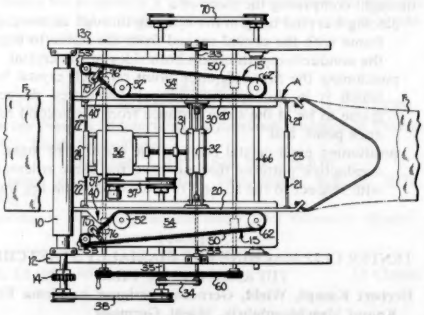
APPARATUS FOR SPREADING TUBULAR FABRIC

Willis W. Coates, 31 N. Pawling St., Hagaman, N.Y. 12068

Filed Mar. 21, 1975, Ser. No. 560,629

Int. Cl.[2] D06C *5/00*

U.S. Cl. 26—55 R **8 Claims**



1. An apparatus for spreading and advancing a continuous length of tubular knit fabric comprising

a. a spreader frame adapted to fit within the continuous length of fabric and having opposite sides adapted to engage and substantially flatten the tubular fabric, said spreader frame including a fabric stretching bulge on each side thereof and adjacent the exit end of said spreader frame, said bulges comprising outwardly diverging and inwardly converging portions, and curved outer extremities connecting said diverging and converging portions,

b. driven fabric advancing belts positioned externally of and adjacent opposite sides of said spreader frame and including outwardly projecting pins carried thereby, said pins having free outer ends engageable with the fabric for exerting positive control therover along opposite sides of said spreader frame, and

c. guide pulleys positioned in spaced relationship adjacent opposite sides of said spreader frame for guiding said belts and for maintaining said pins of said belts in engagement with the fabric throughout a major portion of the length of said spreader frame and along the lengths of said outwardly diverging portions of said bulges so that the tubular fabric is disengaged from said pins without damaging the fabric as the fabric moves over said curved outer extremities of said bulges.

3,916,493

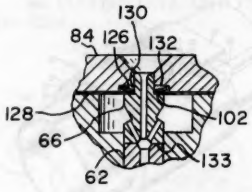
FLUID JET ASSEMBLY FOR TREATING YARNS

Fredrick Allen Ethridge, Charlotte, N.C., assignor to Fiber Industries, Inc., Charlotte, N.C.

Division of Ser. No. 239,579, March 30, 1972, Pat. No. 3,805,343. This application Feb. 4, 1974, Ser. No. 438,988

Int. Cl.[2] D02G *1/16*

U.S. Cl. 28—1.4 **4 Claims**



1. A jet assembly for treating yarns with pressurized fluids comprising:

a housing having a fluid plenum chamber disposed therein, means for supplying fluid to said plenum chamber,

a jet member axially disposed within said plenum chamber, said jet member having yarn and fluid inlets therein,

a yarn outlet fitting abutting said jet member within said housing, said yarn outlet fitting having a yarn outlet therein axially aligned with the yarn inlet of said jet member to define a yarn passageway through the jet assembly, the fluid inlets intersecting the passageway to permit engagement of the fluid with the yarn, said jet member and said yarn outlet fitting each being made of a material having a predetermined coefficient of thermal expansion, said jet member having a significantly different coefficient of thermal expansion from the remainder of said jet assembly and thus being temperature-separable therefrom, said jet member being frictionally mounted in a first stationary wall of said housing and said yarn outlet fitting being fixedly mounted in a second, opposed, stationary wall of said housing,

spring means compressed against said first stationary wall and engaging and likewise compressing said jet member in the direction of said yarn outlet fitting, and

sealing means compressed between said spring means and the surface of said jet member which it engages, thus preventing the flow fluid past the jet member through the wall in which it is mounted, upon sharp changes of temperature in the jet assembly.

3,916,494

MACHINE FOR NEEDLING NON-WOVEN FIBER WEBS

Franz Konig, Linz, Austria, assignor to Dr. Ernst Fehrer Gesellschaft m.b.H. & Co., K.G. Textilmachinenfabrik u. Stahlbau, Linz, Austria

Filed Aug. 16, 1974, Ser. No. 498,847

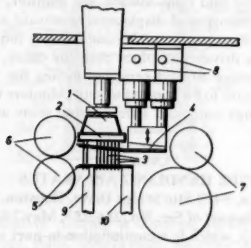
Claims priority, application Austria, Sept. 18, 1973, 8055/73

Int. Cl.[2] D04H *18/00*

U.S. Cl. 28—4 R **2 Claims**

1. In a machine for needling non-woven fiber webs, which comprises a needling unit including a vertically reciprocable needle beam, needle board means carried by the needle beam, a multiplicity of needles carried by and extending from the

needle board means, a perforated stripper plate defining perforations aligned with the needles, and a perforated bed plate defining perforations aligned with the needles, the plates being vertically spaced to define a space therebetween and the plates having leading edges defining therebetween an inlet for a nonwoven fiber web; a pair of feeding and squeezing rollers arranged adjacent the inlet and operable to feed the web through the inlet into the space; and a means spaced from the needling unit on the side opposite the inlet and operable to withdraw the needled web from the space: the improvement of



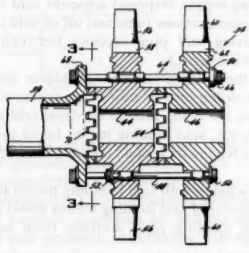
1. means fixing only an end of the stripper plate between the needling unit and the unit drawing means remote from the leading edge thereof,
   a. the leading edge of the stripper plate extending freely close to one of the feeding and squeezing rollers, and
   b. the remote end of the stripper plate extending toward the withdrawing means, and
2. a plurality of supports for the bed plate, including one support nearest to the feeding and squeezing rollers, the leading edge of the bed plate protruding beyond the one support close to the other one of the rollers.

3,916,495

METHOD AND MEANS FOR BALANCING A GAS TURBINE ENGINE

David Dubble Klassen, Reading, and Donald Alan Brozenske, Peabody, both of Mass., assignors to General Electric Company, Lynn, Mass.

Filed Feb. 25, 1974, Ser. No. 445,675
Int. Cl.[2] F01D *25/00*
U.S. Cl. 29—156.4 R **3 Claims**



1. A method of initially balancing a gas turbine engine and thereafter replacing the turbine without performing any additional balancing operations comprises:

balancing a compressor and its connecting shaft for rotation with respect to a forward and aft bearing within the engine;

balancing the original turbine and any replacement turbine therefor for rotation with respect to the same or a substantially identical arbor apart from the engine;

connecting the original balanced turbine to the shaft;

correcting any unbalanced condition precipitated by the connection of the balanced original turbine to the connecting shaft by adding balance weight means to the original turbine, and

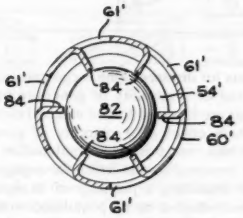
removing and replacing the original turbine with the balanced replacement turbine while maintaining the positions of the balance weight means in the same relative positions on the replacement turbine as on the original turbine.

3,916,496

VALVE ASSEMBLY

Frederick E. Freiheit, East Lansing, Mich., assignor to FMC Corporation, San Jose, Calif.

Division of Ser. No. 309,553, Nov. 24, 1972, Pat. No. 3,830,255. This application Feb. 25, 1974, Ser. No. 445,755
Int. Cl. B21d *53/10*; **B23p** *11/00*
U.S. Cl. 29—157.1 R **1 Claim**



1. A method of forming a valve assembly primarily from difficult to machine stainless steel or the like wherein the valve includes at least an annular valve seat, a valve, and a tubular valve cage having window forming cage material therein comprising; the steps of machining an annular groove in the outer periphery of said valve seat, stamping a plurality of fluid flow windows into said valve cage, press fitting said cage on said valve seat by forming an inwardly curved flange on one end of the valve cage with the inner end of said flange terminating in said annular groove, said cage material which is removed to form said windows remaining attached to one edge of the associated windows, and pressing said window forming cage material substantially radially inward to act as a guide for said valve.

3,916,497

HEAT RESISTANT AND WEAR RESISTANT ALLOY

Hidekazu Doi, and Kenichi Nishigaki, both of Omiya, Japan, assignors to Mitsubishi Metal Corporation, Tokyo, Japan

Filed Feb. 11, 1974, Ser. No. 441,125
Claims priority, application Japan, Feb. 16, 1973, 48-18329
Int. Cl.[2] C22C *29/00*
U.S. Cl. 29—182.8 **8 Claims**

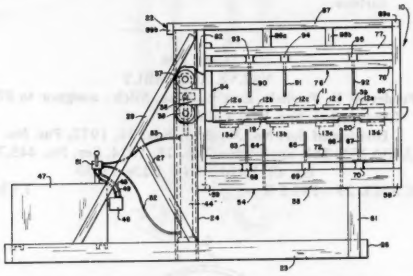
1. A powder metallurgy sintered alloy having a basic composition consisting essentially of, in weight percent based on the total weight of said alloy, from 10 to 90% of substantially uniformly dispersed preformed particles composed of at least one carbide or composite carbide of transition metals of Groups 4a, 5a and 6a and the balance a nickel base matrix consisting essentially of from 50 to 70% Ni, from 2 to 10% Ti, from 0.5 to 10% Al, at least one alloy element selected from the group consisting of from 1 to 10% Fe, from 1 to 20% Co, and from 1 to 20% Cr, and at least one alloy element (B), in an amount sufficient to impart high temperature strength, selected from the group consisting, in weight percent based on said Ni-base matrix, of up to 5% Nb, up to 10% Ta, up to 20% Mo, up to 20% W and up to 5% V, and said alloy element (A) dissolving in said Ni-base matrix in the form of a solid solution.

3,916,498

PALLET DISASSEMBLING METHOD AND APPARATUS

Albert Lopez, Norwalk, and James Adams, San Gabriel, both of Calif., assignors to Safeway Stores, Incorporated, Oakland, Calif.

Filed June 17, 1974, Ser. No. 479,894
Int. Cl.[2] B23P 19/00
U.S. Cl. 29—200 D 6 Claims



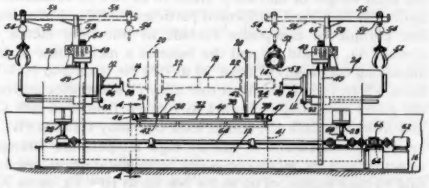
1. Apparatus for disassembling cargo carrying pallets which are constructed of a plurality of generally parallel, spaced-apart slats that are fastened to and extend laterally across, the top and bottom edges of a plurality of generally parallel, spaced-apart ribs, comprising a combination of a frame, a pallet carrier mounted on the frame for engaging the ribs, the pallet carrier including a plurality of elongate horizontally extending tines adapted to be positioned within the spacing formed between an adjacent pair of ribs and the slats which overlie such ribs, first and second breaker members mounted on the frame for engaging the ribs or the pallet, said first breaker members being mounted at a fixed elevation on the frame above the pallet carrier and in register with the top side edges of the pallet ribs at positions thereof which are between adjacent pairs of the slats, the second breaker members being mounted at another fixed elevation on the frame below the pallet carrier and in register with the bottom side edges of the pallet ribs at portions thereof which are between adjacent pairs of the slats, and actuating means operable in one mode for moving the pallet carrier and tines toward the first breaker members whereby the slats on the top edges of the ribs of a pallet mounted on the tines are separated from the ribs, said actuator means further being operable in another mode for moving the carrier and tines toward the second breaker members whereby the slats on the bottom edges of the ribs are separated therefrom.

3,916,499

HYDRAULIC BEARING MOUNTING PRESS

Charles W. Frame, and Jack A. Rickrode, both of Chambersburg, Pa., assignors to Chambersburg Engineering Company, Chambersburg, Pa.

Filed Jan. 9, 1975, Ser. No. 539,819
Int. Cl.[2] B23P 19/02
U.S. Cl. 29—208 C 23 Claims



1. A hydaulic press for simultaneously mounting bearing on bearing seats at opposite ends of an axle comprising:

a supporting frame,

opposing cylinders mounted on said frame,

hydraulic rams in each cylinder movable toward the other to engage and position an axle between them, in a predetermined position, each ram having means for supporting the bearing concentric with the seat of said axle and further means relatively movable with respect to each said ram for driving the respective bearing from said supporting means onto their respective adjacent axle bearing seat,

fluid sealing means between the cylinder and rams,

fluid supply means for supplying fluid to each of said cylinders to drive said rams toward one another,

means for sensing axial displacement of said axle from its center position as a result of one bearing requiring more force to be driven into place than the other, and

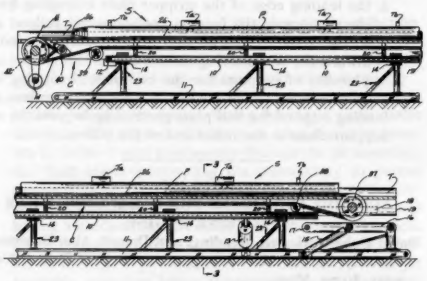
means responsive to said sensingn means for causing unequal pressure to be applied to said cylinders to drive said axle bearings onto said axle bearing seats and recenter said axle.

3,916,500

PIPE HANDLING APPARATUS

Cicero C. Brown, 5429 Sturbridge Drive, Houston, Tex. 77027

Continuation-in-part of Ser. No. 256,255, May 24, 1972, Pat. No. 3,792,783, which is a continuation-in-part of Ser. No. 125,740, March 18, 1971, Pat. No. 3,706,347. This application Jan. 16, 1974, Ser. No. 433,733
Int. Cl.[2] E21B 19/14
U.S. Cl. 29—240 29 Claims



27. A pipe handling system for moving pipe between horizontal storage racks and a well drilling derrick comprising:

a. rack means for receiving and storing a plurality of pipe sections in substantially a horizontal position;

b. pipe handling means disposed adjacent said rack means for moving pipe sections onto and off of said rack means and for moving said pipe sections between said rack means and said derrick;

c. elongate, pipe holding means included in said handling means for holding one or more pipe sections while said pipe sections are being moved between said rack means and said derrick, said holding means being pivoted at its first end and having its second end disposed adjacent said derrick;

d. tilt means included with said handling means for effecting tilting movement of said holding means about a longitudinal axis for ejecting pipe sections from said holding means;

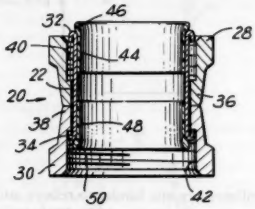
e. powered elevating means engageable with connection means carried adjacent said second end of said pipe holding means for raising and lowering said second end to thereby pivot said holding means about said first end between a substantially horizontal position and an inclined position at which said second end is proximate the floor of said derrick; and

f. pipe rotating means in addition to the well drilling means employed in said drilling derrick for imparting a rotary motion to a pipe section in said holding means.

3,916,501
LIQUID-TIGHT SWIVEL COUPLER FOR ELECTRICAL CONDUIT

John J. Brett, Glen Ellyn, Ill.; Jonah Eidelberg, Huntington Station, and Thomas Mooney, Mount Sinai, both of N.Y., assignors to Electrical Fittings Corporation, Eastfarmingdale, N.Y.

Continuation of Ser. No. 324,089, Jan. 16, 1973, Pat. No. 3,828,117. This application Apr. 17, 1974, Ser. No. 461,642
Int. Cl. B23p *11/00*
U.S. Cl. 29—437 **7 Claims**

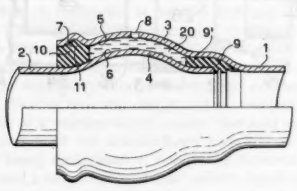


1. A method of making a coupling for attachment to a conduit having walls, comprising: supporting an elongated tubular body member formed of a ductile metal and having a bore passing therethrough, positioning a pair of clamping members in back-to-back relation about said tubular body intermediate of its ends, and radially expanding opposite ends of said tubular body to flare said ends outwardly to a diameter greater than the diameter of the opening of said clamping members, relatively dimensioning said body and clamping members to permit the relative longitudinal movement of said clamping members on said end expanded body member.

3,916,502
METHOD OF ESTABLISHING A PIPE JOINT

Luigi Bagnulo, Via A. Volta, 18, Milan, Italy

Division of Ser. No. 289,913, Sept. 18, 1972, abandoned. This application Jan. 10, 1974, Ser. No. 432,342
Claims priority, application Italy, Sept. 17, 1971, 28751
Int. Cl.² B23P *11/02*
U.S. Cl. 29—451 **7 Claims**

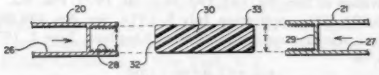


1. A method of establishing a rigid pipe joint, comprising the steps of providing the respective ends of the pipes to be joined with interfitting male and female end portions having respective longitudinal axes; providing an inlet opening in said female end portion; mounting an annular sealing gasket on one of said end portions; introducing said male end portion coaxially and with clearance into said female end portion; subjecting said end portions to opposite axial forces urging said sealing gasket into contact with both end portions so that it prevents further axial displacement thereof beyond their respective relative positions and separates said clearance from the interior of said male end portion; introducing an annular locking ring into said clearance to lockingly engage said end portions in their respective relative positions and to seal said clearance with respect to the exterior of said male end portion; discontinuing said axial forces whereupon said locking ring prevents said end portions from axially displacing out of said respective relative positions, whereby a sealed semi-rigid pipe joint is obtained; and introducing a hardenable flowable material into said sealed clearance between said sealing gasket and said locking ring through said inlet opening in said female end portion, whereby a sealed rigid pipe joint is obtained upon solidification and hardening of said hardenable material.

3,916,503
METHOD OF MAKING THERMAL BARRIER LINEAL METAL SHAPES

Edward L. Chenevert; Joseph N. LaBorde, and Robert E. Waltman, all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Jan. 2, 1974, Ser. No. 430,099
Int. Cl.² B23P *11/02*
U.S. Cl. 29—450 **11 Claims**



1. A method of forming a thermal barrier lineal metal construction shape comprising the steps of:

a. aligning a pair of lineal metal shapes adjacent each other in generally parallel spaced apart relation, each of said metal shapes having a top surface, bottom surface and vertical wall surface, and each of said metal shapes having a channel therein of a predetermined size adapted to receive a lineal insulating shape and one of said channels facing the other of said channels;

b. aligning adjacent to said channels of said metal shapes and therebetween said channels, a lineal insulating shape adapted to be received by said channels, said insulating shape having a top surface, bottom surface and vertical side wall surfaces, and said insulating shape being of a predetermined size so related to the size of said channels that an interference fit is obtained when said insulating shape is inserted in said channels and,

c. applying mechanical forces to move said channels of said metal shapes towards each other to thereby bring together the metal shapes and the insulating shape to form an interference fit between said metal shapes and said insulating shape, said interference fit occurring between the top surface and bottom surface of said lineal metal shapes and the top surface and bottom surface of said lineal insulating shape, thereby forming a unitary lineal thermal barrier construction shape.

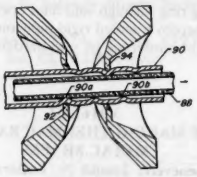
3,916,504
METHOD OF MAKING SPIRAL TUBE MIXING DEVICE

John K. Thorne, Decatur, Ala., and Jay E. Sobel, Highland Park, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Division of Ser. No. 402,871, Oct. 2, 1973, Pat. No. 3,866,886. This application Sept. 25, 1974, Ser. No. 509,154
Int. Cl.² B21D *39/00*; B23P *11/00*
U.S. Cl. 29—455 **5 Claims**

1. A method of forming a mixing device comprinsing the steps of: positioning a cylindrical porous tube inside a cylindrical, non-porous outer tube, said outer tube having an inner diameter which is larger than the outer diameter of the inner tube; corrugating the outer tube to form a spiral groove by means of a pair of dies engaged with opposite outer side portions of the tube, said dies being axially spaced from each

other; and additionally corrugating said tube by contacting said groove with at least one die to deepen said groove and



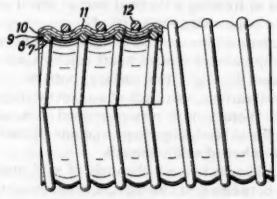
force the ridges which define it in•o intimate contact with said porous inner tube.

3,916,505

METHOD OF MAKING FLEXIBLE HOSE

Joseph White, Didsbury, England, assignor to Compoflex Company Limited, England

Division of Ser. No. 145,392, May 20, 1971, Pat. No. 3,835,891. This application July 5, 1974, Ser. No. 486,084
Claims priority, application United Kingdom, June 2, 1970, 26636/70
Int. Cl.² B23P *11/00*
U.S. Cl. 29—456 **3 Claims**



1. A process for the manufacture of hose or tube comprising: winding on a mandrel an inner wire coated with a material selected from the group consisting of fluorinated ethylene propylene copolymer and polytetrafluoroethylene, the convolutions of the winding being spaced apart; applying over the inner wire and the mandrel at least one layer of layflat tubing made of fluorinated ethylene propylene copolymer; applying over the layer of fluorinated ethylene propylene copolymer at least one layer of polypropylene fabric; applying over the layer of propylene fabric an outer cover of polypropylene fabric coated with polyvinyl chloride; and winding on an outer wire the turns of which are displaced half a pitch from the turns of the inner wire.

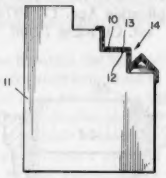
3,916,506

METHOD OF CONFORMING A FLEXIBLE SELF-SUPPORTING MEANS TO THE SURFACE CONTOUR OF A SUBSTRATE

Jack D. Wolf, Indianapolis, Ind., assignor to Mallory Composites, Indianapolis, Ind.

Filed Oct. 18, 1973, Ser. No. 407,656
Int. Cl.² B23K *31/02*
U.S. Cl. 428—457 **9 Claims**

1. In a method of coating a substrate with a wear resistant material including wear resistant powder and a matrix material, the matrix material being the product of a flowing powdered material having a melting point temperature lower than the melting point temperature of the wear resistant powder, the method including the steps of providing a flexible self-supporting means including the wear resistant powder and the powdered material to serve as a matrix material in a heat decomposable fibrillated organic binder, overlaying the substrate with the flexible self-supporting means, causing the flexible self-supporting means to substantially conform to the contour of the substrate, and heating the flexible self-supporting means to a temperature below the decomposition temper-



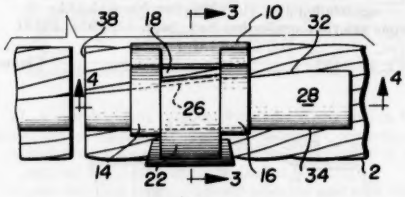
ature of the fibrillated organic binder to relieve stresses in the flexible self-supporting means caused by conforming the flexible self-supporting means to the contour of the substrate.

3,916,507

METHOD OF BANDING AND CUTTING A STRAND OF WIRES

James L. Mc Grath, Medinah, Ill., assignor to Reliable Electric Company, Franklin Park, Ill.

Filed Sept. 30, 1974, Ser. No. 510,637
Int. Cl.² B23P *19/00*
U.S. Cl. 29—526 **2 Claims**



1. A method of banding and cutting a strand of the type that is made up of a plurality of helically laid wires comprising: providing a low profile band having opposite end portions with relatively flat loops, one of said end portions having spaced aligned loops and the other of said end portions having a further loop, said further loop being adapted to be disposed between said spaced aligned loops, said opposite ends being initially spaced apart to provide a lateral opening, assembling the band with the strand by a movement that causes the strand to pass through said lateral opening, bringing the loops in juxtaposition so that said end portions are circumferentially overlapping, inserting a key into said loops and by moving said key therein drawing the band tightly around the strand so that the band adds only a small amount to the diameter of the strand, and then severing the strand adjacent to said band to form a free end of said strand, whereby the tight grip of the band on the wires prevents the wires at said free end from becoming out of lay.

3,916,508
METHOD OF MAKING A REFERENCE VOLTAGE SOURCE WITH A DESIRED TEMPERATURE COEFFICIENT

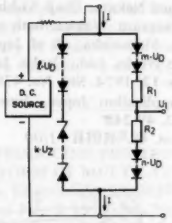
Gerhard Conzelmann, Leinfelden, and Hartmut Seiler, Reutlingen, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Mar. 4, 1974, Ser. No. 447,514

Claims priority, application Germany, Mar. 23, 1973, 2314423

Int. Cl.² H01L 21/66; G05F 3/14

U.S. Cl. 29—574 **23 Claims**



1. A method of making a source of reference voltage having a desired temperature coefficient of said reference voltage and containing at least one Zener diode, the number of Zener diodes being designated k, and a number of conductively poled diodes, possibly zero and designated l, connected in series with said Zener diode(s) and comprising also a shunt circuit branch connected in parallel with said Zener diode(s) and the aforesaid conductively poled diodes, composed of a resistive voltage divider having an intermediate tap providing an output terminal for a reference voltage (U_1) and, in series with said voltage divider, a number of conductively poled diodes, possibly zero and designated m, connected between a first pole of a current supply source and said voltage divider and also at least one conductively poled diode, the number thereof being designated n, connected between said voltage divider and a second pole of said current supply means, which method comprises the steps of:

making a source of reference voltage having components as above set forth in such a way as to approximate a design criterion of

$$\frac{m+n-l}{k} = \frac{B}{U_{Do}\cdot(A-A_D)}$$

without regard to the scatter of Zener breakdown voltages of Zener diodes used, said scatter being within a reasonable manufacturing tolerance, and

progressively modifying the resistance values of the resistances (R_1, R_2) of said voltage divider and thereby trimming said voltage divider at a predetermined reference temperature T_o until the value U_{1o} that the output reference voltage U_1 has at the aforesaid reference temperature T_o reaches the predetermined value

$$U_{1o} = U_{Do}\cdot\frac{A-A_D}{A-E}$$

where

A is the constant portion of the temperature coefficient of the Zener diodes in °K⁻¹,

A_D is the temperature coefficient of the conductively poled diodes in their conductive state, in °K⁻¹,

B is the voltage-dependent portion of the temperature coefficient of the Zener diodes in volts per °K,

U_{Do} is the voltage drop per diode in volts across the conductively poled diodes during conduction at the reference temperature T_o, and

E is said desired temperature coefficient of said reference voltage U_1, in °K⁻¹.

3,916,509
METHOD OF MANUFACTURING A SEMI-CONDUCTOR TARGET FOR A CAMERA TUBE HAVING A MOSAIC OF P-N JUNCTIONS COVERED BY A PERFORATED CONDUCTIVE LAYER

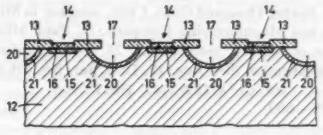
Arthur Marie Eugene Hoeberechts, and Else Kooi, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 345,133, March 26, 1973, abandoned, which is a division of Ser. No. 140,734, May 6, 1971, Pat. No. 3,737,701. This application Jan. 30, 1975, Ser. No. 545,620

Claims priority, application Netherlands, May 16, 1970, 7007171

Int. Cl.² B01J 17/00

U.S. Cl. 29—578 **5 Claims**



1. A method of manufacturing a target for a camera tube comprising the steps of covering a surface of a plate of semiconductor material of given conductivity type with a layer of insulating material having windows therein, introducing through said windows a conductivity-determining impurity to form regions of opposite conductivity in said plate, applying electrically conductive layers over the layer of insulating material over each of said regions and through said windows in contact with each of the said regions of opposite conductivity type, and removing the semiconductor material between the regions of the mosaic to form longitudinal hollow grooves with the insulating layer and conductive layer projecting above the edge of each of the grooves.

3,916,510
METHOD FOR FABRICATING HIGH EFFICIENCY SEMI-PLANAR ELECTRO-OPTIC MODULATORS

William E. Martin, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 1, 1974, Ser. No. 484,484

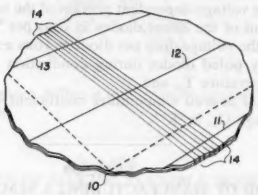
Int. Cl.² B01J 17/00

U.S. Cl. 29—583 **10 Claims**

1. A method of fabricating high-efficiency, semi-planar, electro-optic modulators comprising the steps of:

depositing an electro-optically responsive epitaxial waveguiding layer of material transparent to known wavelengths of light energy on a low resistivity single crystal substrate;

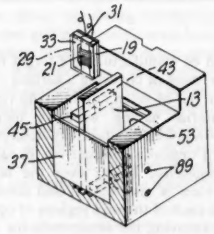
depositing an optical buffer material on said epitaxial waveguiding material, said optical buffer material having a lower index of refraction than said epitaxial waveguiding material;
depositing a first electrode on said optical buffer material;
depositing a second electrode on the bottom of said substrate;
determining the natural cleavage plane of the substrate;



aligning the composite material in a scribing means for scribing said substrate parallel to the natural cleavage plane of the substrate;
scribing said substrate for cleaving said composite material in situ along two widely spaced parallel lines defining the entrance and exit faces of a plurality of modulators; and
scribing multiple closely spaced parallel lines at 90° to the widely spaced parallel lines for cleaving said composite material in situ, completing the formation of a plurality of modulators.

3,916,511
METHOD OF MAKING MAGNETIC HEADS AND THE LIKE

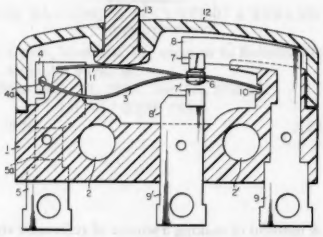
Harold C. Brehe, Thousand Oaks, Calif., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Division of Ser. No. 364,926, May 28, 1973, abandoned. This application filed Aug. 12, 1974, Ser. No. 496,660
Int. Cl.² G11B 5/42; H01F 7/06
U.S. Cl. 29—603 **5 Claims**



1. A method of making a magnetic head assembly of the type which comprises a plurality of components including a center shield and first and second cores on opposite sides of the center shield, said method comprising:
providing a fixture which includes a peripheral wall and an end wall defining at least one open-ended assembly compartment with the end wall having first and second intersecting locator grooves therein, said fixture having a reference surface which is accurately located with respect to said locator grooves;
positioning the center shield in said first groove and positioning the first and second cores in the second groove on opposite sides of the center shield;
inserting additional components of the magnetic head into the cavity;
urging the first and second cores along said second groove and into contact with the second shield;
pouring a hardenable substance into the compartment and allowing said substance to harden to thereby join together at least some of the components of the magnetic head assembly;
reducing at least a portion of the end wall to a nonsolid state thereby removing said portion of the end wall to expose a portion of the magnetic head assembly including the center shield and the cores;
mounting the fixture on a fixture mounting device with the fixture mounting device contacting the reference surface to accurately position the fixture and the magnetic head assembly;
performing a work operation on the exposed portion of the magnetic head assembly; and
reducing a sufficient portion of the remainder of said fixture to a nonsolid state to allow removal of the fixture from the magnetic head assembly.

3,916,512
METHOD OF MAKING MICROSWITCHES

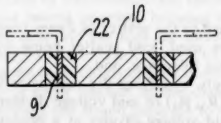
Yutaka Sato; Yoshinori Nakata; Shoji Nishimori, all of Tsu; Takeshi Nishii; Masayasu Wakita, both of Mie, and Yoshimasa Takeshita, Matsusaka, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan
Filed June 12, 1974, Ser. No. 478,579
Claims priority, application Japan, June 13, 1973, 48-67052; Dec. 27, 1973, 49-248
Int. Cl.² H01H 11/00
U.S. Cl. 29—622 **8 Claims**



1. The method of making a micro type switch assembly which comprises the steps of supplying a main metal strip having openings at regular intervals to define a first set of switch elements arranged substantially in the same plane, supplying at right angles to said main strip a subsidiary metal strip having openings at regular intervals to define a switch element including a wing portion requiring bending out of said plane, performing a molding operation so as to integrally join the leading end of the subsidiary metal strip with the main metal strip in spaced relation, severing the subsidiary strip to free the switch element which includes the wing portion, and bending the wing portion out of the plane of the assembly.

3,916,513
FORMING INTERCONNECTIONS BETWEEN CIRCUIT LAYERS

Nathan Thomas Ballard, Santa Monica, Calif., assignor to Ampex Corporation, Redwood City, Calif.
Filed May 3, 1974, Ser. No. 466,549
Int. Cl.² H05K 1/04
U.S. Cl. 29—625 **2 Claims**



1. The method of fabricating a conductive, flat substrate suitable for use in a multiple layer electronic structure, said

substrate having two generally parallel flat sides, having a plurality of vias extending from one flat side of the substrate to the opposite parallel flat side, said vias being insulated from the conductive substrate and being held in a matrix of plastic material, comprising the following steps:

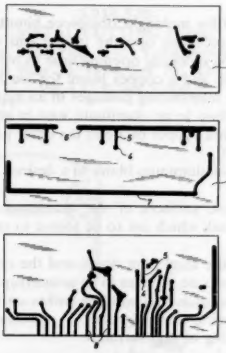
a. providing a conductive substrate having holes therein extending from side-to-side corresponding to the placement of the desired vias,
b. forming at least one metal plate having a series of fingers thereon, said fingers corresponding to a desired via configuration,
c. bending said fingers at an angle to said plate and placing said plate over said substrate whereby the bent over fingers extend through the holes of the conductive substrate without touching the same,
d. placing said plate and said substrate in an insert mold and flowing plastic into said holes around said fingers,
e. causing said plastic to set, and
f. removing excess portions of the fingers from both sides of said substrate to provide a completed flat substrate having a plurality of insulated vias extending from one surface of said substrate to the opposite surface of said substrate.

3,916,514

METHOD OF PRODUCING PRINTED CIRCUIT CARDS IN THE FORM OF MULTILAYER PRINTS

Aarne Salminen, Elmevaenget 23, 2880 Bagsvaerd, Denmark

Filed July 2, 1973, Ser. No. 375,858
Claims priority, application Denmark, July 3, 1972, 3308/72
Int. Cl.² H05K *3/00*
U.S. Cl. 29—625 **1 Claim**



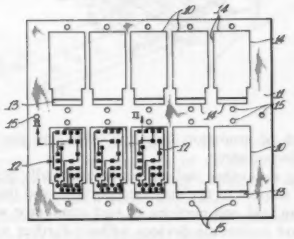
1. A method of forming a printed circuit in the form of a multilayer board on the basis of an existing schematic diagram of an electrical circuit, the layout of the wiring patterns of the individual layers of the multilayer boards comprising the steps of disposing over a light table in the following order, a precision grid, three transparent sheets and a sheet of tracing paper, one transparent sheet serving as a master for a "component" layer of the multilayer board, the second serving as a master for a "power supply" layer of the multilayer board, and the third serving as a master for an "interconnections" layer of the multilayer board; mutually fixing said sheets so that each one is easily accessible; positioning on appropriate ones of the transparent sheets solder pads for the terminals of the individual components forming the circuit, markings of passage holes, and interconnecting conductor paths in accordance with said schematic diagram, starting at an input end of the diagram and working step by step throughout the diagram, considering simultaneously said three layers of the multilayer board; concurrently drawing the component images on the tracing paper at positions corresponding to the positions of the associated solder pads on the transparent sheets; and finally employing the completed masters when transferring the wiring patterns from the masters to the individual layers of the multilayer board.

3,916,515

METHOD OF PRODUCING PRINTED CIRCUIT BOARD IN MULTIPLE UNITS

Matthew John Walsh, Lachine; Frederick Luis Gaiser, Otterburn Park, and Robert Normand Marcotte, Laval des Rapides, all of Canada, assignors to Northern Electric Company, Montreal, Canada

Filed Sept. 26, 1974, Ser. No. 509,486
Int. Cl.² H05K *3/34*
U.S. Cl. 29—626 **5 Claims**



1. A method of producing printed circuit boards in multiple units, the boards carrying electrical components, comprising; shearing individual boards, each board having a circuit thereon, from a sheet of glass fibre impregnated with synthetic resin, to leave apertures in said sheet, the sheet having a thickness greater than 0.050 inch;
returning the sheared boards into said apertures in said sheet;
stacking a plurality of sheets and returned boards and heating to a predetermined temperature and cooling, while weighted, to flatten the sheets and returned boards;
mounting said components on the boards while retained in the sheets;
soldering the components to the related circuit.

3,916,516

ELECTRICAL CONNECTOR AND METHOD FOR MAKING AN ELECTRICAL CIRCUIT

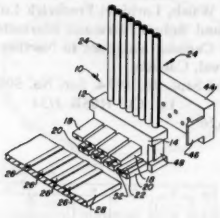
William J. Harms, Nunica, and Fred W. Loy, Whitehall, both of Mich., assignors to Gardner-Denver Company, Dallas, Tex.

Division of Ser. No. 340,781, March 13, 1973, Pat. No. 3,855,567. This application Sept. 25, 1974, Ser. No. 509,174
Int. Cl.² H01R *43/00*
U.S. Cl. 29—628 **4 Claims**

1. An improved method of making electrical connections with insulated flexible conductor wire between at least two connector devices which are adapted to receive, respectively, opposite uninsulated end portions of a flexible conductor wire, comprising the steps of:
preparing one end portion of an indeterminate length of conductor wire by cuttin and stripping a predetermined length of insulation therefrom;
providing first and second wire holding means for holding opposite end portions of a conductor wire and feeding an end portion of said conductor wire into and through said second holding means and into said first holding means;
bending said one end portion substantially perpendicular with respect to the insulated portion to secure said one end portion in said first holding means;

moving said first holding means into a position adjacent one of the connector devices after bending said one end portion and thereby pulling said conductor wire through said second holding means; then,

cutting the conductor wire to length by severing the wire on the side of said second holding means from which said conductor wire was fed and stripping a predetermined



length of insulation from the other end portion of said conductor wire;

bending said other end portion substantially perpendicular with respect to the insulated portion; and then,

inserting said end portions of said conductor wire directly in said connector devices without further working said end portions.

3,916,517

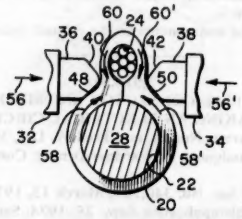
PARALLEL SPLICE AND METHOD OF MAKING SAME

Albert M. Luongo, Edison, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed Jan. 6, 1975, Ser. No. 538,815

Int. Cl.[2] H01R *43/00*

U.S. Cl. 29—628 **4 Claims**



1. A method of making a parallel splice between a first and a second relatively incompressible rigid elongate article comprising the steps of: providing an elastically deformable connecting means having a first chamber and a second chamber arranged in juxtaposed parallel relationship; inserting said first article within said first chamber; inserting said second article within said second chamber; and subjecting said connecting means to a highly localized compression force directed along a common axis and restrictively confined solely to an area located intermediate said first chamber and said second chamber to cause at least a portion of the material forming the walls of said first chamber and said second chamber to be simultaneously peripherally displaced towards the axis of application of said localized compression force and contracted about said first article and said second article.

3,916,518

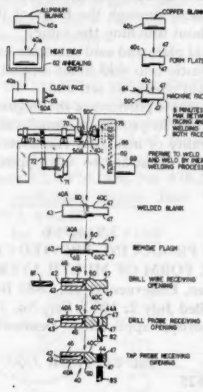
METHOD FOR MAKING ONE-PIECE BIMETALLIC CONNECTOR

Benjamin G. Jones, Milwaukee, and Richard B. Leachy, Brookfield, both of Wis., assignors to Coatings, Inc., Milwaukee, Wis.

Continuation-in-part of Ser. No. 402,756, Oct. 2, 1973, Pat. No. 3,876,280. This application Oct. 10, 1974, Ser. No. 513,740

Int. Cl.[2] H02G *15/00*

U.S. Cl. 29—629 **20 Claims**



1. A method for making a one-piece bimetallic connector having a wire receiving opening in one end and a threaded transverse probe receiving opening near its other end from an aluminum blank and a copper blank for use in one of a pair of transversely intersecting passages in an electrical terminator for connection to an aluminum wire in said one passage and to a threaded copper probe in the other passage comprising the steps of:

annealing said aluminum blank to a desired degree of hardness;

cleaning those surfaces of the aluminum blank and the copper blank which are to be joined to removed impurities;

and joining the aluminum blank and the copper blank entirely across said surfaces in an uninterrupted interface by the process of inertia welding within an interval of time not exceeding approximately 5 minutes subsequent to said cleaning of said surfaces.

3,916,519

PIPE CUTTING MACHINE

Guy T. Gilmore, Houston, Tex., assignor to Multi-Fab, Inc., Houston, Tex.

Filed May 29, 1974, Ser. No. 474,231

Int. Cl.[2] B23B *3/04, 3/22*

U.S. Cl. 30—97 **3 Claims**

1. In an improved apparatus for performing work functions on pipes of varying diameters, the combination including:

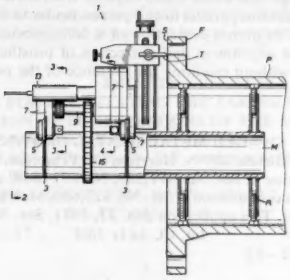
a mandrel means adapted to be affixed to the pipe so as to serve as a supporting base for the machine, said mandrel means including a surface means on which the machine traverses a path of movement while performing its operation on the pipe,

a machine movably affixed on the mandrel means, said machine including a strut means affixed at each end thereof, each said strut means including a pair of cooperating strut legs, at least one of said strut legs being angu-

larly adjustably mounted with respect to its cooperating leg,

a roller means rotatably affixed to each said strut legs for supporting said machine on the pipe surface, and,

longitudinally adjustable coupling means having the first end thereof affixed to one of said strut legs and the other end affixed to the cooperating strut leg so that the angle defined by the radii lines from the mandrel axis to the



points of contact of said roller means on the pipe may be changed in order to adapt the machine for stable movement when working on varying diameter pipes,

said surface means comprises a protruding track, the roller means on said cooperating legs being mounted so that each roller means bears on opposing sides of said protruding track to thereby enhance control of directional movement.

3,916,520

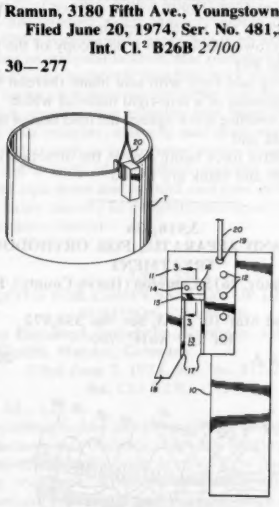
METAL CUTTING TOOL

Michael Ramun, 3180 Fifth Ave., Youngstown, Ohio 44505

Filed June 20, 1974, Ser. No. 481,387

Int. Cl.[2] B26B *27/00*

U.S. Cl. 30—277 **5 Claims**



1. A metal cutting tool consisting of a weight, a guide structure secured thereto and extending sidewardly and downwardly therefrom, a cutting blade mounted in said guide structure, said guide structure defining a vertical slot open at its lower end with the metal cutting blade positioned at the opposite upper end of said slot and positioning the cutting edge of said cutting blade in said slot, means in said guide structure and weight to which a supporting element can be attached whereby the metal cutting tool may be alternately lifted and dropped so as to move downwardly in a cutting action in a metal plate to be cut.

3,916,521

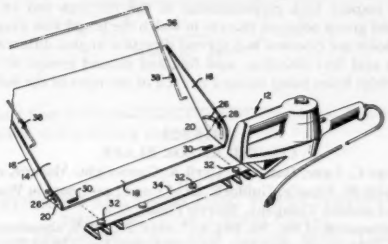
HEDGE CLIPPING CATCHER TRAY

George Sekelsky, 70 Sekelsky Drive, Stratford, Conn. 06497

Filed Sept. 30, 1974, Ser. No. 510,178

Int. Cl.[2] B26B *19/48*

U.S. Cl. 30—132 **8 Claims**



1. A clipping catcher attachment for a hedge trimming device operable to trim the ends of shrubbery, twigs and branches along a cutting plane, having a stationary cutting bar and a reciprocating shear blade, comprising:

A. an adjustable clipping catcher tray incorporating a main body portion with cooperating sides;

B. a bottom hingedly attached to said main body portion and secured to a cutting bar of said trimming device;

C. means detachably connecting said tray with said bottom and adjusting the angle of said clipping catcher tray relative to the cutting plane of said trimming device over a plurality of angles comprising a range of adjusted positions; and

D. an extensible outrigger bar having adjustment leg means grippingly engaged in elongated anchoring sleeve aperture means extending generally perpendicular to the cutting bar formed in the main body portion of the clipping catcher tray, whereby the outrigger bar may be extended away from or retracted toward said cutting bar.

3,916,522

OUTER BLADE FOR RECIPROCAL TYPE ELECTRIC SHAVER

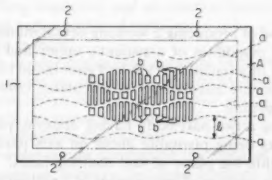
Satoshi Sakai; Norio Shimizu; Junji Nomura, and Norboru Ueji, all of Osaka, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Sept. 20, 1974, Ser. No. 507,709

Claims priority, application Japan, Oct. 8, 1973, 48-113005

Int. Cl.[2] B26B *19/04*

U.S. Cl. 30—346.51 **3 Claims**



1. In an outer blade for an electric shaver in the form of a flat perforated thin metal plate of rectangular outline capable of being bent into U shape for cooperating with a cyclically moving interior blade of conforming profile for shearing beard hairs, the combination comprising a plurality of ribs extending

generally longitudinally along axes which are spaced generally parallel to one another, said ribs being of generally sinusoidal shape with adjacent ribs being out of phase with one another causing the spacing between them to continuously vary, and a plurality of rows of generally slit-shaped and closely spaced hair inlet holes respectively defined between the adjacent ribs, said holes extending generally from rib to rib so that the length of the respective holes as measured generally from rib to rib varies in accordance with the varying spacing between the ribs, said plurality of hair inlet holes comprising (a) a first group of holes in which the lengthwise axes of the generally slit-shaped holes are oriented in a first direction slightly angled with respect to a perpendicular to the rib axes and (b) a second group adjacent thereto in which the lengthwise axes of the holes are oriented in a second direction angled differently from said first direction, said first and second groups of the hair inlet holes being located in each of the rows of the holes.

3,916,523

COATED RAZOR BLADE

George C. Lane, Danbury; Cyril A. Cartwright, Monroe, and Keith W. Elmslie, Guilford, all of Conn., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation of Ser. No. 861,937, Sept. 29, 1969, abandoned. This application Dec. 26, 1973, Ser. No. 428,583

Int. Cl.[2] B26B *21/54;* **C23C** *15/00*

U.S. Cl. 30—346.53 **2 Claims**

1. A razor blade comprising at least one cutting edge, a chromium coating on said cutting edge, and an aluminum oxide coating on said chromium coating.

3,916,524

METHOD OF MANUFACTURING A WORKING MODEL OF BELONGING TOGETHER MAXILLAS AND MANDIBLES

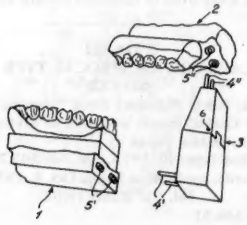
Gregers Lystager, Skelstedet 6, Trorod, DK-2950 Vedbak, Denmark

Filed Mar. 25, 1974, Ser. No. 454,311

Claims priority, application Denmark, Mar. 26, 1973, 1635/73

Int. Cl.[2] A61C *13/00*

U.S. Cl. 32—11 **3 Claims**



1. A method of producing a working dental model of related maxillas and mandibles of a patient's upper and lower jaws whereby cast of a patient's teeth and gum tissue on the upper and lower jaws are attached to an articulated correlator, said method comprising:

a. providing a two-part body having abutting planar faces, said parts being pivotable about an axis parallel to and lying within the plane of said abutting faces;

b. providing castings of impressions of a patient's upper and lower jaws;

c. aligning a first of said jaw castings with its occlusal plane in the plane of the abutting faces of said first named body and casting a base for said first jaw against a surfae of said body which includes fixed mounting means parallel to said abutting faces; and

d. aligning the second of said jaw castings with its occlusal plane in the plane of the abutting faces of said first named body and casting a base for said second jaw against a surface of said body which includes fixed mounting means perpendicular to said abutting faces, thereby producing a dental model which is capable of pivoting about said axis to simulate the patient's biting action, which is capable of disassembly and reassembly without altering the proper relative positions of said upper and lower jaw castings, and which is also capable of separate adjustment in directions parallel to and perpendicular to said occlusal plane to permit correction of a faulty occlusion and to permit adjustment and correction of prosthetic restorations without requiring the presence of the patient.

3,916,525

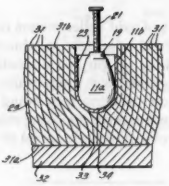
SWAGED METAL DENTAL CROWNS

Arnold J. Hirsch, 207 N. Harrison St., Princeton, N.J. 08540

Continuation of Ser. No. 871,589, Nov. 7, 1969, abandoned, which is a continuation of Ser. No. 623,680, March 16, 1967, abandoned. This application Jan. 21, 1971, Ser. No. 108,648

Int. Cl. A61c *5/08*

U.S. Cl. 32—12 **9 Claims**



1. A method for swaging dental crowns and bands to conform to the contour of a tooth to be crowned except for the undercut portion of the tooth comprising

a. placing a crown blank upon a rigid copy of the tooth to be crowned and

b. then forcing said copy with said blank thereon between confined laminae of a non-rigid material which

1. exerts a resistive force against the insertion of said copy and blank and

2. the resistive force being only in the direction in which said copy and blank are forced.

3,916,526

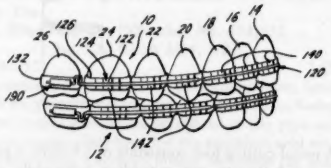
METHOD AND APPARATUS FOR ORTHODONTIC TREATMENT

Fred Frank Schudy, 2615 Cameron (Harris County), Houston, Tex. 77006

Filed May 10, 1973, Ser. No. 358,972

Int. Cl.[2] A61C *7/00*

U.S. Cl. 32—14 A **20 Claims**



1. An orthodontic apparatus for the treatment of the anterior and posterior teeth of a dental arch comprising:

an arch wire having a rectangular cross section with a large dimensioned side and a small dimensioned side; said arch wire having two approximately **90°** twists located at the

juxtapositions of the anterior and posterior teeth on each side of the dental arch;

labial brackets secured to the anterior teeth and each having a slot slightly larger than the dimension of the small dimensioned side of the arch wire;

buccal brackets secured to the posterior teeth and each having a slot slightly larger than the dimension of the large dimensioned side of the arch wire; and

said small dimensioned side of said arch wire being slidingly received within the slot of said labial brackets and said larger dimensioned side of said arch wire being slidingly received within the slot of said buccal brackets.

3,916,527

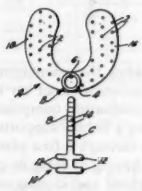
DEVICE FOR FACILITATING THE TAKING OF AN IMPRESSION OF BONE PORTIONS OF THE MOUTH, AND METHOD OF USING SAME

Leonard I. Linkow, Cedarhurst, N.Y., assignor to Oratronics, Inc., New York, N.Y.

Filed Jan. 30, 1973, Ser. No. 328,123

Int. Cl.[2] A61C *9/00*

U.S. Cl. 32—17 **24 Claims**



1. A device for facilitating the taking of an impression for a pterygoid extension implant comprising (A) an essentially U-shaped flexible sheet with a tubular neck portion extending from an intermediate point thereon remote from both ends thereof, (B) a post member extending from said neck portion and having an irregular outline, said post member comprising a separate piece insertable into said neck portion, and (C) a body of impression material set within said neck portion and about said inserted post member end integrating said sheet and said post member, whereby said sheet may be shaped to provide a first surface conforming to the bone structure of a patient and a body of impression material set on a second surface of said sheet and around said post member will capture the latter, thereby to integrate said device with said body of impression material.

3,916,528

APPARATUS FOR COMPENSATION OF DIMENSIONAL POSITION CHANGES

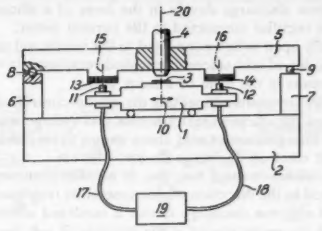
Hermann Eisenkopf, Naunheim, Germany, assignor to Ernst Leitz GmbH, Wetzler, Germany

Filed June 7, 1974, Ser. No. 477,211

Int. Cl.[2] B23Q *17/18*

U.S. Cl. 33—125 C **9 Claims**

1. Apparatus for the compensation of changes in position, due to dimensional variation, between two instrument parts, said parts being displaceable in relation to one another in at least one coordinate direction, comprising a first instrument part, a second instrument part movable with respect to said first instrument part along a coordinate and including means to support same adjacent said first instrument part, first and second means, associated with said two instrument parts at locations spaced substantially along said coordinate, for detecting the position of said instrument parts along said coordinate, said position detecting means generating output signals representative of the relative position of said first and second parts at each of said spaced locations respectively, and circuit means coupled with said first and second position detecting means to provide an average signal from said output signals, said average signal being proportional to the relative position



of said first and second parts at a measurement location intermediate said detecting means.

3,916,529

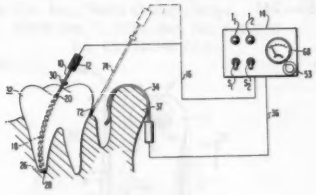
METHOD OF AND INSTRUMENT FOR DETERMINING THE LENGTH OF A ROOT CANAL

Calvin Mitchell Mousseau, 8615 Eastside Drive, Tacoma, Wash. 98422

Filed Nov. 8, 1973, Ser. No. 414,148

Int. Cl.[2] G01B *7/26;* **A61B** *5/05*

U.S. Cl. 33—174 D **1 Claim**



1. An instrument for determining the length of a root canal of a tooth comprising:

probe means comprising a probe in the form of a thin, flexible metal wire adapted to be introduced into the root canal and a conductor member adapted to be held in electrical contact with the patient's body in the vicinity of the tooth, wherein said probe may be, in a calibration step, positionable at the juncture of soft tissue and the tooth, the length of a root canal of which is to be determined, and thereafter may be introduced into said root canal until said indicator means indicates the same reading as that obtained in said calibration step;

a voltage source;

a step-down transformer connected to the voltage source;

a full-wave rectifier connected across the transformer for producing a D.C. output;

a smoothing capacitor and an electric lamp connected in parallel and across said rectifier;

a variable resistor;

a voltage divider comprising a pair of fixed resistors;

first circuit means connecting said probe means, said conductor member, said variable resistor and said fixed resistors in series across said voltage source;

a current amplifying transistor;

second circuit means connecting the input of said amplifying transistor between the fixed resistors of the voltage divider;

a fixed resistor connected to one side of said voltage source and the collector of the current amplifying transistor;

a fixed resistor connected to the other side of said voltage source and the emitter of the current amplifying transistor;

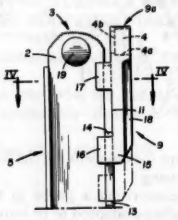
a current meter serving as an indicator means;
third circuit means including an inductance coil connected between the current meter and the collector side of the amplifier;
an electron discharge device in the form of a silicon-controlled rectifier connected to the current meter;
a normally open switch connected to the anode and cathode electrodes of said silicon-controlled rectifier;
alarm means in the form of a lamp; and
fourth circuit means connecting the silicon-controlled rectifier and the alarm in series across said voltage source to cause energization of said alarm means upon conduction of said electron discharge device; wherein
said variable resistor may be, in a calibration step, adjusted in the direction of decrease of its resistance until said electron discharge device is rendered conductive, with the probe placed at the juncture of soft tissue and the tooth, and
said silicon-controlled rectifier is adapted to be rendered conductive when the output of said amplifier exceeds a predetermined level.

3,916,530

SIGHTING MEANS FOR FIREARMS

Paul E. Tellie, St. Etienne, France, assignor to ETAT FRANCAIS - Delegation Ministerielle Pour L'Armement, Paris Armees, France

Filed May 17, 1974, Ser. No. 470,854
Claims priority, application France, June 1, 1973, 73.19954
Int. Cl.[2] F41G *1/32*
U.S. Cl. 33—241 **3 Claims**



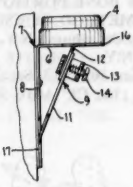
1. A firearm comprising:
a front sight comprising a thin upper portion, said front sight being in a plane transverse to the longitudinal axis of the firearm,
a front sight support rigidly connected to the firearm,
said front sight being rigidly connected to said front sight support,
a rear sight,
a luminescent pellet of dimensions greater than the thin transverse dimension of the upper portion of the front sight, said luminescent pellet being positioned a slight distance in front of said front sight, on the opposite side of the front sight from the rear sight, so that a marksman using the firearm upon nighttime firing can distinguish the upper portion of said front sight against a luminous background formed by said luminescent pellet,
a support for the luminescent pellet, said luminescent pellet support comprising sliding means slidable over a front portion, substantially perpendicular to the longitudinal axis of the firearm, of said front sight support between a first position in which the luminescent pellet is in front of the upper portion of the front sight and a second position in which the pellet is retracted so as to not be in the line of sight,
a first projection on said front sight support,
a second projection on said front sight support,
said first projection and said second projection being spaced from each other on the front portion of the front sight support, and
said luminescent pellet support is in its first position when in abutment with said first projection and is in its second position when in abutment with said second projection.

3,916,531

LEVELING METHOD AND DEVICE FOR MOTOR HOME

Paul S. Morton, 82 Mandalay Drive, Oshtemo Twp., Mich. 49009

Filed Jan. 2, 1974, Ser. No. 429,941
Int. Cl.[2] G01C *9/36*
U.S. Cl. 33—333 **4 Claims**



1. In a device for reading the orientation of a vehicle body to ensure the proper orientation of an item of equipment carried thereby, the combination comprising:
a container for holding a bubble supporting liquid and being of circular section through a first plane;
a transparent cover having at least its perimeter generally parallel with said plane and closing said container;
liquid within said container defining a bubble adjacent said cover;
a bracket comprising a single sheet of material bent to form a generally L-shape for mounting said container against a surface defining a second plane generally perpendicular to said first plane, said container being mounted on one of the legs of said bracket;
a brace struck out from said single sheet so that said brace and said L-shaped bracket are composed of said single sheet, said brace being integrally attached at one end to one leg of said bracket and being integrally attached at the other end to the other leg of said bracket, said brace comprising a pair of segments, one being slidable along the other; and
adjusting means intermediate the ends of said brace for adjusting the effective length of said brace and the precise angle between the legs of said L-shaped bracket, said adjusting means comprising a clamp which when loose permits such sliding and when tight fixes said segments with respect to each other to hold said brace firmly in an adjusted position whereby to hold said bracket with the one leg thereof and the other leg in precisely adjusted angular relationship with respect to each other.

3,916,532

METHOD FOR PRODUCING PARTICULATE MATERIAL BY FREEZE DRYING

Raymond Edward Jaeger, Basking Ridge, and Thomas John Miller, Green Brook, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 180,505, Sept. 14, 1971, abandoned. This application Jan. 7, 1974, Ser. No. 431,122
Int. Cl.[2] F26B *5/06*
U.S. Cl. 34—5 **8 Claims**

1. The method of freeze drying aqueous solutions of metal salts which comprises freezing such solutions in the form of droplets and removing the solvent from said frozen droplets by sublimation, wherein the improvement comprises incorporating in said solutions, prior to freezing, and in addition to said

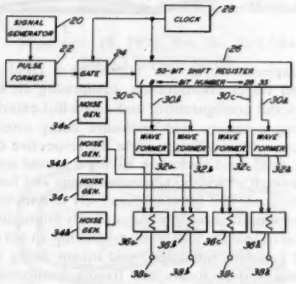
metal salts, an additive selected from the group consisting of ammonium hydroxide, alkyl ammonium hydroxides wherein the alkyl substituents contain from 1–4 carbon atoms and salts of ethylene diamine tetraacetic acid, which raises the freezing point of said solution and reduces any tendency to supercool.

3,916,533

CIRCULAR ARRAY HYDROPHONE SIMULATOR

Michael M. Kijesky, Warminster, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 2, 1974, Ser. No. 466,118
Int. Cl.² G09B *9/00*
U.S. Cl. 35—10.4 **7 Claims**



1. Apparatus for simulating the progressively delayed outputs resulting from impingement of sonic energy having a point source on a nonlinear array of hydrophones, comprising:
signal generating means for providing an analog output signal having a frequency simulative of the point source;
pulse forming means connected to receive said analog output signal for converting the analog output signal into a digital pulse train output signal;
clock means for providing clock pulses at predetermined equal intervals;
delay means connected to receive said clock pulses and said digital pulse train output signal for providing a plurality of outputs each representative of the pulse train but serially delayed by one interval; and
a plurality of wave forming means corresponding to the number of hydrophones in the nonlinear array respectively connected to receive preselected ones of said delay means outputs for converting said delay means outputs to analog output signals, said preselected ones of delay means outputs corresponding to the predicted impingement times of the sonic energy at the respective hydrophones;
a plurality of noise generating means for producing random noise output signals simulative of a water body; and
a plurality of summing means having a first input connected to receive respective ones of said noise generating means outputs signals and a second input connected to receive respective ones of said wave forming means analog output signals for respectively summing the noise and analog signals to form output signals simulative of individual hydrophone outputs within said nonlinear array.

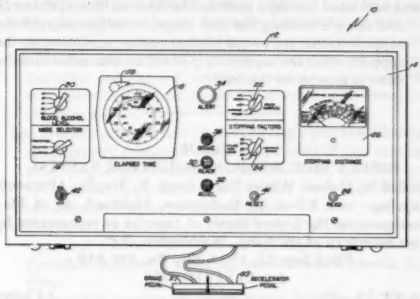
3,916,534

DRIVER EDUCATION TEACHING AND TESTING DEVICE

Edward W. Riccio, 17 Stanhope Drive, Barrington, R.I. 02806

Filed Mar. 19, 1974, Ser. No. 452,542
Int. Cl.² G09B *9/04*
U.S. Cl. 35—11 **8 Claims**

1. A psycho-physical teaching and testing device for driver education, comprising a first mode for testing perception characteristics of a user of the device, a second mode that is cumulative with said first mode for testing reaction characteristics, a third mode that is cumulative with said first and second modes for relating stopping characteristics thereto, and



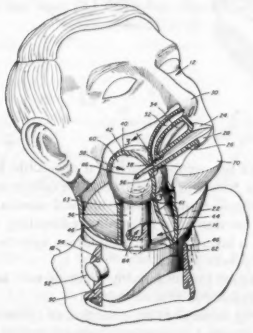
means for selectively programming variable stopping factors into said third mode, said second mode including means for simulating degrees of blood alcohol level in the user, wherein the time for reacting to a braking operation is correspondingly affected.

3,916,535

NECK ASSEMBLY FOR MANNEQUIN

Carl Hewson, Marshfield, Mass., assignor to Brunswick Manufacturing Co., Inc., North Quincy, Mass.

Filed Jan. 7, 1974, Ser. No. 431,019
Int. Cl.² G09B *23/28*
U.S. Cl. 35—17 **1 Claim**



1. A mannequin for teaching lung ventilation comprising
a collar for representing the neck of a human body,
a support pivotally connected to the collar with the pivotal axis extending from side to side of the neck,
an extension carried by and fixed at one end to the support and carrying a ball at its free end,
a head simulating the head of a human and having a nose and mouth and also having a neck portion with a socket which receives the ball, said ball and socket enabling the head to tilt back and forth and turn side to side on the ball,
an air passage in the head from the mouth to the socket,
a second passage in the ball and extension and communicating with the passage in the head when the head is tilted back to a selected position,
said second passage being open to said collar,
said support being generally dish shaped at the end facing the head and having a pair of bosses extending outwardly

therefrom in opposite directions and defining a pivotal axis for the support on the collar,

said collar having a pair of aligned openings therein for releasably receiving the bosses,

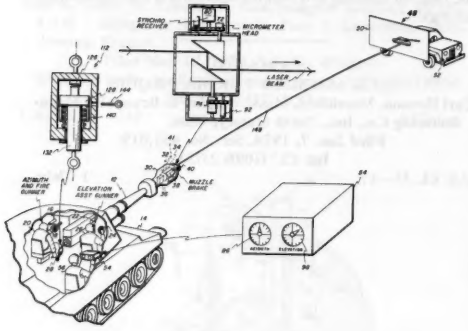
and said head having a rounded bottom surface at the neck and complementing the dish shaped configuration of the support so that the round bottom surface can move on the support when the support is pivoted on the collar and the head is moved on the ball.

3,916,536

DIRECT FIRE WEAPON SIMULATOR SYSTEM

Windell N. Mohon, Winter Park; Denis R. Breglia, Altamonte Springs, and Alfred H. Rodemann, Maitland, all of Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 22, 1974, Ser. No. 490,819
Int. Cl.[2] F41G 3/26
U.S. Cl. 35—25 **3 Claims**



1. In a direct fire weapon having a projectile barrel, means for moving the barrel in azimuth and elevation and utilizing a detachable muzzle brake having aligned apertured rear and front flanged sections for normally redirecting and choking powder flash, a laser fire type simulation system comprising

a laser and power pack,

mounting means for detachably securing said laser and pack in said detachable muzzle brake,

said mounting means having a section of cylindrical exterior with an internal passageway contoured to receive and hold said laser and pack therein, and rear and front flanges having annular oppositely facing inclined centering surfaces,

one of said mounting means flanges being detachably mountable on one end of said cylindrical section to provide means for centering and clamping said laser and pack and associated mounting cylinder in said muzzle brake,

beam deflector means having mirrors and means for adjusting said mirrors on respective axes which are in 90 degree relation to each other to enable beam adjustment in azimuth and elevation to correspond to target speed and range, and weapon and projectile characteristics, and thus provide unprogrammed problem variation,

coupling means for detachably securing said deflector means to said laser to pass the laser beam therethrough in adjustable deflection for elevation and azimuth setting, and

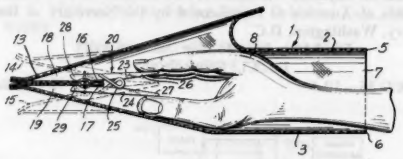
a lanyard operated switch means for operating said laser.

3,916,537

DEVICE FOR IMPROVING A CHILDS MANUAL DEXTERITY AND FINGER COORDINATION

Marjorie Crocker Gilligan, 163 Brewster Road, Massapequa, N.Y. 11758, and Robert C. Le Porte, 2095 Great Neck Road, Copiague, N.Y. 11726

Filed Feb. 5, 1974, Ser. No. 439,783
Int. Cl.[2] A63B 21/32; A63H 3/14
U.S. Cl. 35—29 E **1 Claim**



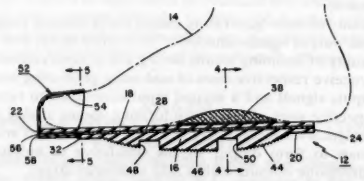
1. A therapeutic device for improving a child's manual dexterity and finger coordination, comprising an enclosure having a fanciful configuration, and a fanciful exterior simulating a living creature, said enclosure being interiorly arranged to receive and accommodate the respective digits and hand of the child, said enclosure having a closed end and an open end through which the respective digits and hand of the child are received, and means operatively connected to said enclosure for simultaneously manipulatively animating contiguous portions of said enclosure for mimicking an act or condition of said creature simulated, said means being interiorly located within said enclosure and fixedly connected thereto overlying said manipulable contiguous portions thereof, said means being manipulable by the coordinative operation of at least two digits of the child's hand, said means comprising a first lever member operatively connected to one of said contiguous portions, a second lever member operatively connected to another of said contiguous portions, and a pressure-responsive biasing means for pivotably connecting said first and second lever members, said first and second lever members being simultaneously reciprocable between first and second positions about a substantially common fulcrum for thereby selectively animating said contiguous portions of said enclosure to which said first and second lever members are respectively connected.

3,916,538

WALKING HEEL

Herbert S. Loseff, 308 Wordley Road, Winnetka, Ill. 60093

Filed Feb. 20, 1975, Ser. No. 551,349
Int. Cl.[2] A43B 3/12; A61F 5/04
U.S. Cl. 36—11.5 **10 Claims**



1. An improved walking heel for use with a plaster cast on a patient's lower extremities so as to permit the patient to ambulate without damaging the plaster sole of the cast, the improved walking heel comrpising:

a generally elongated rectangular base having a longitudinal axis which is aligned with the longitudinal axis of the patient's cast when the heel is mounted on the cast, the base including a first surface adapted to be positioned adjacent to the sole of the cast and a second surface adapted to engage the ground when the heel is secured to

the sole of a cast, with the second surface having a plurality of transverse grooves being formed therein;

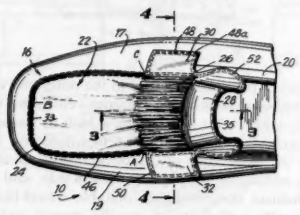
a first piece of plaster of paris impregnated material attached to the base and positioned so as to overlie at least a portion of the first surface of the base, the first piece of material, when wetted, being adapted to assist in affixing the heel to the sole of the cast; and

at least one roll of plaster of paris impregnated material which is attached to the base and which when wetted, is adapted to be wrapped around the cast and the base so as to assist in affixing the heel to the sole of the cast.

3,916,539
SHOE CONSTRUCTION

Jerome Pankin, New York, N.Y., and Beverly Ann Feldman, Alicante, Spain, assignors to Pankin International Ltd., New York, N.Y.

Filed Apr. 18, 1975, Ser. No. 569,284
Int. Cl.[2] A43B *11/00*
U.S. Cl. 36—51 **9 Claims**



1. A construction for a shoe including a vamp, a sole, and a heel, the construction comprising:

a. a tongue member,

b. a lining member, the tongue member and the lining member being joined to one another and to the vamp, and forming a continuous tunnel across the throat of the shoe, and

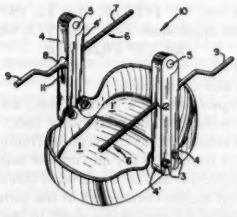
c. an elastic gore running from one side of the vamp across the throat of the shoe to the other side of the vamp and fixed within the tunnel,

d. the gore, when relaxed, shirring the tongue member at its mid-section and the lining member.

3,916,540
HAND-ACTUATED SCREW OPERATED TRANSPLANTER

Frank Ortiz, 648 W. San Francisco St., Santa Fe, N. Mex. 87501

Filed Feb. 2, 1973, Ser. No. 296,323
Int. Cl.[2] A01G *23/02*
U.S. Cl. 37—2 R **1 Claim**



1. A transplanter comprising two cooperating half-hemispherically shaped blades with opposed sharpened edges which extend substantially across the width of said blades are in a closed position to completely sever the roots of the tree being transplanted each said blade having apertures through said wall portion at opposite ends of said cutting edge.

two pairs of arms;

one of said pairs of arms removably attached to said blades at adjacent ends of said cutting edges;

each pair of arms being hingedly connected at one end thereof by a pivot pin defining a pivot axis and each arm of each pair of arms having a bore therethrough adjacent the other end thereof, attaching means cooperating with said apertures in said blades to provide said removable attachment;

one arm of each said pair of arms having a slot therethrough substantially midway between said ends of said arm and extending longitudinally between said ends, the other arm of each said pair having a threaded bore therethrough substantially aligned with said slot;

means to move the arms of each pair of arms between an open and a closed position, comprising a screw having a threaded portion, a shoulder portion and a handle portion;

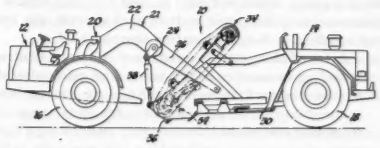
the threaded portion of each screw having a diameter smaller than the width of each said slot is said one arm of each pair so as to pass freely therethrough and engage the threaded bore in said other arm of each pair;

the shoulder portion of each screw having a diameter larger than the width of each slot so as to abut thereagainst as said screw is turned by said handle portion to thereby move said arms of each pair and their attached blades from said open to said closed position.

3,916,541
ADJUSTABLE MECHANISM FOR A SCRAPER ELEVATOR

Richard A. Hood, Stow, and Thomas L. Raab, Seven Hills, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 11, 1974, Ser. No. 522,574
Int. Cl.[2] E02F *1/00*
U.S. Cl. 37—8 **3 Claims**



1. An earthmoving self-loading scraper having a tractor connected by a pull yoke to a trailing scraper bowl, said scraper bowl having an open end defined by a pair of laterally spaced side walls and a transverse cutting blade extending between the side walls, an elevator device having an upper end and a lower end, a linkage including upper and lower link members mounting said elevator device at said open end of the scraper bowl with the lower end of the elevator device being supported adjacent to and above the cutting blade and being movable about a transverse horizontal axis relative to said cutting blade, one end of each of said link members being pivotally connected to said scraper bowl and the other end of each of said link members being pivotally connected to the elevator device, a mechanism for adjusting the position of the lower end of the elevator device relative to the cutting blade, said mechanism comprising a base member rigidly attached to one of said side walls, said base member having an elongated slot formed therein, a plurality of teeth formed along an outer edge of said base member, an arm supporting one of said link members adjacent the other end thereof and being provided with a pair of pins, one of said pins being located within said slot so as to provide a connection with the base member that allows said other pin to pivot outwardly relative to said base member and permits the arm to move upwardly and down-

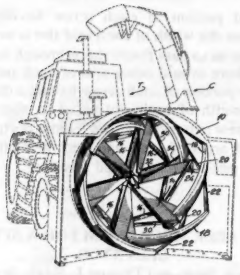
wardly whereby said other pin can be adjustably located between a pair of said plurality of teeth to vary the position of said other end of one of said link members and the spacing between the lower end of the elevator device and the cutting blade.

3,916,542

ROTOR ASSEMBLY FOR SNOW BLOWER

Hilaire Blanchet, 300 Route 13, Wickham Court, Drummond, Quebec, Canada

Filed Apr. 22, 1974, Ser. No. 463,116
Int. Cl.[2] E01H *5/09, 8/06;* **B65G** *31/04*
U.S. Cl. 37—43 R **2 Claims**



1. A snow blower rotor assembly of the type having a centrally located horizontal hub, a series of spoke-like shovels fixed at the inner ends to said hub and projecting from said hub in a plane which is radial to said hub and means rigidly interconnecting the outer ends of said shovels, the improvement residing in the combination therewith of

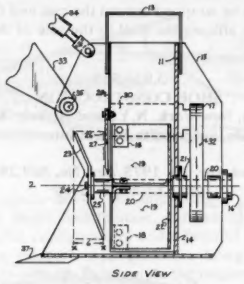
a. a series of elongated, 2 sided snow chopping blades corresponding in number to the number of said radial shovels;
b. wherein each snow-chopping blade has an inner end secured to one of said shovel outer ends, projects away from said one of said shovel outer ends along a longitudinal axis to an outer end and lies in a generally cylindrical plane perpendicular to said radial plane of said shovels;
c. wherein in said cylindrical plane each blade is tapered gradually in width from its inner to its outer end and each blade's outer end is inclined longitudinally forwardly with respect to the direction of the rotation to be applied to said rotor assembly;
d. wherein each blade has a concave cross-section when viewed from said hub;
e. wherein each blade is twisted about its longitudinal axis from its secured inner end to its outer end;
f. stiffening means interconnecting said chopping blades to prevent deformation thereof during rotation; said stiffening means extending in said generally cylindrical plane whereby said blades and stiffening means form, in rotation, a generally hollow cylinder open at one end and closed at the other end by said radial shovels and wherein said stiffening means comprises, for each chopping blade, a first rigid bar fixed at one end to the inner end of the preceding chopping blade and at the other end to the center of said each blade on one side and a second rigid bar fixed at one end to the center of said each blade on the other side and at the other end to the outer end of the following blade; said following and preceding blades being considered with respect to the direction of rotation to be applied to said assembly.

3,916,543

PIVOTABLE BUCKET WITH ROTATABLE SHREDDER BLADE AND EARTH EJECTOR

John M. Poche, 6317 Franklin Ave., New Orleans, La. 70122

Filed July 24, 1974, Ser. No. 491,378
Int. Cl.[2] E02F *3/24*
U.S. Cl. 37—93 **4 Claims**



1. A bucket pivotable secured to the outer end of an elbow type power boom attached to a carrier vehicle having hydraulic power, said bucket comprising a built in housing with an earth moving mechanism adapted to rotate and a discharge chute on the upper side of the bucket, said chute having an angularly adjustable deflector at the top side, said earth moving mechanism comprising a rotatable wheel-like structure provided with a plurality of equally spaced and outwardly extending earth ejecting blades integral with said wheel-like structure, said blades each being provided with a cutter secured to the radial edge of the blade, the wheel-like structure being mounted on a horizontally disposed power shaft having a shredder blade secured by means of a plurality of shear bolts to a hub mounted on the outer end of the power shaft, the shear bolts protecting the mechanism of the bucket from damage due to obstructions in the earth in which the bucket digs, and a hydraulic motor mounted in the bucket and connected to the shaft by a reduction drive mechanism for rotating the shaft, the front and upper portion of the said bucket being provided with a trapezoidal shaped combination shear blade and compression plate having a sharp lower edge, the said combination shear blade and compression plate forming a compression chamber in the upper portion of the said bucket.

3,916,544

SIDEBANK EXCAVATOR WITH GRADE AND SLOPE CONTROL

George W. Swisher, Jr., and Autho Hale, both of Oklahoma City, Okla., assignors to CMI Corporation, Oklahoma City, Okla.

Division of Ser. No. 142,725, May 12, 1971, Pat. No. 3,778,912. This application Sept. 20, 1973, Ser. No. 398,840
Int. Cl.[2] E02F *9/20*
U.S. Cl. 37—110 **3 Claims**

1. An excavator comprising:

a support frame, having a cutting side, an earth removal side, a forward end and a rearward end;

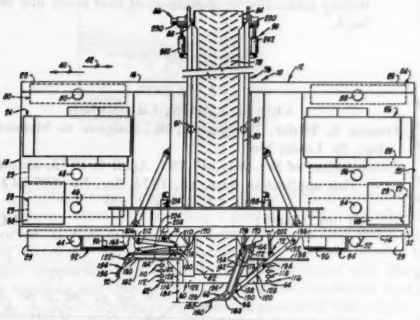
drive means connected to the support frame for supporting the support frame and for moving the support frame in a forward direction and in a rearward direction;

earth removal means connected to the cutting side of the support frame for excavating earth in the forward direction and in the rearward direction of the support frame;

a grade and slope control automatically positioning the support frame and the earth removal means connected thereto in a predetermined slope position relative to a predetermined horizontal plane, comprising:

a vertical positioning assembly having a portion thereof connected to a portion of the drive means and another portion thereof connected to the support frame, the vertical positioning assembly raising the support frame in a generally vertically upwardly direction in one actuated position thereof, and lowering the support frame in a generally vertically downwardly direction, in one other actuated position thereof, comprising:

first forward hydraulic cylinder means disposed generally near the forward end and generally near the cutting side of the support frame, and being hydraulically connected to raise and to lower the support frame relative to a single predetermined control position, generally near the forward end and generally near the cutting side of the support frame;



second forward hydraulic clinder means disposed generally near the forward end and generally near the earth removal side of the support frame;

first rearward hydraulic cylinder means disposed generally near the rearward end and generally near the cutting side of the support frame and being hydraulically connected for raising and lowering the support frame relative to a single predetermined control position generally near the rearward end and generally near the cutting side of the support frame;

second rearward hydraulic cylinder means disposed generally near the rearward end and generally near the earth removal side of the support frame, the second rearward hydraulic cylinder means connected in hydraulic parallel to the second forward hydraulic cylinder means for raising and lowering the earth removal side of the support frame relative to a single predetermined control position generally near the earth removal side of the support frame and generally between the forward end and the rearward end of the support frame;

a power fluid supply hydraulically connected to the first forward hydraulic cylinder means, the second forward hydraulic cylinder means, the first rearward hydraulic cylinder means and the second rearward hydraulic cylinder means supplying actuating power fluid thereto when in communication therewith; and,

a grade and slope actuator connected to the vertical positioning assembly actuating the vertical positioning assembly to elevate the support frame in a generally upwardly direction and in a generally downwardly direction, comprising:

a first control valve interposed between the first forward hydraulic cylinder means and the power fluid supply, having a first energized position establishing communication between the first forward hydraulic cylinder means and the power fluid supply actuating the first forward hydraulic cylinder means raising the support frame, and a second energized position establishing communication between the first forward hydraulic cylinder means and the power fluid supply actuating the first forward hydraulic cylinder means lowering the support frame;

a second control valve interposed between the first rearward hydraulic cylinder means and the power fluid supply, having a first energized position establishing communication between the first rearward hydraulic cylinder means and the power fluid supply actuating the first rearward hydraulic cylinder raising the support frame, and a second energized position establishing communication between the first rearward hydraulic cylinder means and the power fluid supply actuating the first rearward hydraulic cylinder lowering the support frame;

a third control valve interposed between the second forward hydraulic cylinder means, the second rearward hydraulic cylinder means and the power fluid supply, having a first energized position establishing communication between the second forward hydraulic cylinder means, the second rearward hydraulic cylinder means and the power fluid supply raising the support frame, and a second energized position establishing communication between the second forward hydraulic cylinder means, the second rearward hydraulic cylinder means and the power fluid supply lowering the support frame;

an energizing power supply connected to the first control valve, the second control valve, and the third control valve providing energizing power thereto when in communication therewith;

a first switch interposed between the first control valve and the energizing power supply, having a disconnect position interrupting communication therebetween, a first position establishing communication therebetween energizing the first control valve to the first energized position thereof, and a second position establishing communication therebetween energizing the first control valve to the second energized position thereof;

a second switch interposed between the second control valve and the energizing power supply, having a disconnect position interrupting communication therebetween, a first position establishing communication therebetween energizing the second control valve to the first energized position thereof, and a second position establishing communication therebetween energizing the second control valve to the second energized position thereof; and,

a third switch interposed between the third control valve and the energizing power supply, having a disconnect position interrupting communication therebetween, a first position establishing communication therebetwen energizing the third control valve to the first energized position thereof, and a second position establishing communication therebetween energizing the third control valve to the second energized position thereof.

3,916,545

EJECTOR MECHANISM FOR SCRAPER

Eugene Hochmann, Hudson, and Richard C. Breitenstein, Solon, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

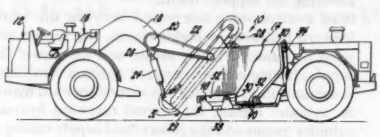
Filed Nov. 13, 1974, Ser. No. 523,210

Int. Cl.[2] E02F *9/28*

U.S. Cl. 37—126 AB **3 Claims**

1. An earthmoving self-loading scraper having a tractor connected by a pull yoke to a trailing scraper bowl, said scraper bowl having an open end defined by a pair of laterally spaced side walls and a transverse cutting blade extending between these side walls, a fixed floor located between said side walls and being spaced to the rear of said cutting blade so as to provide an opening in the lower portion of the scraper

bowl, an ejector system in the scraper bowl for discharging material through said opening in said lower portion of the scraper bowl, said ejector system comprising an upright ejector plate between the side walls and a movable floor section for closing said opening in said lower portion of the scraper bowl, a linkage interconnecting the ejector plate with said movable floor section for controlling movement thereof, said linkage including a first lever pivotally carried by the scraper bowl and having a portion thereof pivotally connected to the rear of the ejector plate, a second lever located rearwardly of said first lever and having an intermediate portion thereof pivotally connected to said scraper bowl, means pivotally



connecting one end of the second lever to the rear of said movable floor section, a power actuator supported by the scraper bowl and connected to said second lever for moving said one end so as to draw the movable floor section rearwardly to expose said opening in the lower portion of the scraper bowl and thereby drop by gravity a portion of the material in the scraper bowl, and lost motion means connecting the second lever to said first lever whereby said ejector plate is moved forwardly by said power actuator after said movable floor is moved rearwardly so that the remaining material in the scraper bowl is discharged through said opening in the lower portion of the scraper bowl.

3,916,546

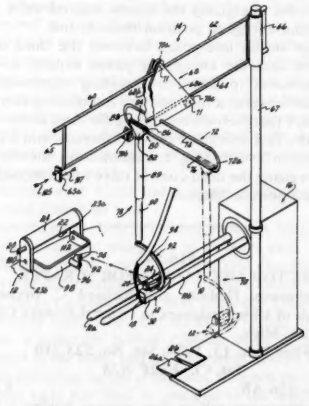
SEAMBUSTING APPARATUS AND METHOD

Norman J. Bullock, Prospect; Frank W. Wendt, Jeffersontown, and Laddie A. DePas, Louisville, all of Ky., assignors to Walter P. Goodman, New Albany, Ind. and W. M. Cissell Manufacturing Company, Louisville, Ky.

Filed Nov. 18, 1974, Ser. No. 524,642

Int. Cl.[2] D06F *69/00*

U.S. Cl. 38—1 B **16 Claims**



1. Apparatus for opening and flattening a seam having mating edges of fabric joined together along an elongated seam line, comprising:

an elongated buck having a convex outer surface adapted to support the seam with the mating fabric edges thereof outboard, and

an iron having a sole plate including a central elongated bottom surface region terminating at a forward edge in a pointed nose configuration to spread apart and thereby open the mating fabric edges of a seam when moved forwardly thereover along the seam line thereof, said central elongated bottom surface region having a length substantially less than the length of said buck and being concavely configured to correspond to said convex outer buck surface for overbusting a seam, which is sandwiched therebetween with the mating edges thereof adjacent said sole plate, by pressing said edges to form an angle along said seam line which substantially exceeds 180°,

said convex and concave surfaces each having a radius of curvatures less than approximately two inches and more than approximately one-half inch to facilitate appreciable overbusting and avoid significant spring-back while minimizing criticality in alignment of said seam line on said buck.

3,916,547

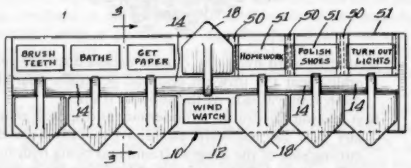
VISUAL REMINDER DEVICE

Francis E. Ryder, Barrington, Ill., assignor to Memo-Chek, Inc., St. Louis, Mo.

Continuation of Ser. No. 347,797, April 4, 1973, abandoned. This application Sept. 18, 1974, Ser. No. 507,042

Int. Cl.[2] G09F *11/06*

U.S. Cl. 40—104.02 **7 Claims**

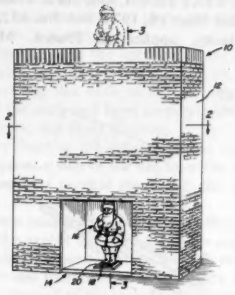


1. In a visual reminder device, or the like, of the type having indicia thereon and a toggle mechanism associated with said indicia for movement between first and second indicating positions, the combination comprising: a base member, at least one boss formed on said base member and defining a channel having a central axis, cam element engaging means formed on said base member and being spaced from said central axis of said channel by a predetermined distance; a toggle member mounted to said base member for movement between first and second positions relative to said boss, said toggle member including a tab portion at one extremity for manual engagement and a cam portion formed integrally thereon at an opposite extremity including opposed tapering cam segment means with a reduced diameter portion at the free end thereof; and integrally formed biasing and mounting means in the form of at least one resilient arm member extending transversely of said cam and tab portion, said arm member being received in said channel for maintaining said toggle member in assembly with said base member and being spaced from the free extremity of said cam portion a distance greater than said predetermined distance, such that upon manipulation of said toggle member for movement between said first and second positions, said cam portion will be brought into engagement with said cam element engaging means, with continued movement urging said cam portion against said cam element engagement means and producing flexure of said resilient arm member thereby permitting said toggle member to move from said first position to said second position with a snap action, with said resilient arm member being retained in either said first or second position and prevented from inadvertent repositioning thereof.

3,916,548
ANIMATED WINDOW DISPLAY

Dennis W. Langer, 2310 Plover Road, Wisconsin Rapids, Wis. 54494

Filed Feb. 22, 1974, Ser. No. 444,697
Int. Cl.² G09F 19/02
U.S. Cl. 40—106.3 3 Claims

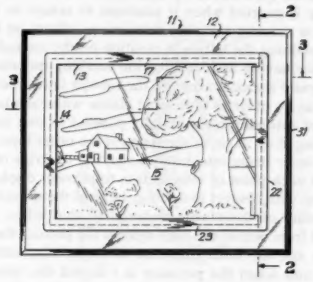


1. A display device comprising an upstanding guide member, a display assembly including a guided member movably supported by said guide member and being guided thereby during generally vertical movement, and endless flexible member supported with a portion thereof parallel with the guide member and disposed adjacent thereto, means on said flexible member to engage said display assembly when adjacent the bottom of the guide member and to disengage from the display assembly when adjacent the top of the guide member, means driving the flexible member in a direction to lift the display assembly along the guide member and release the display assembly when it reaches a point adjacent the upper end of the guide member for free gravitational movement of the display assembly down the guide member independent of the flexible member, and means concealing a major portion of the guide member and display assembly during a major portion of its movement and revealing the display assembly at the top and bottom portions of its movement, rigid means extending alongside the portion of the flexible member parallel to the guide member and positioned on the opposite side of the flexible member from the guide member and forming a guide surface for maintaining the portion of the flexible member parallel to the guide member in a straight condition thereby maintaining said engaging means on the flexible member in engagement with the display assembly, said flexible member being in the form of an endless sprocket chain, a pair of vertically spaced sprocket gears, said chain being entrained over said sprocket gears, said rigid means being in the form of a vertically disposed plate engageable with the inner surface of the portion of the chain disposed adjacent the guide member, said means on the flexible member being in the form of a projection on the exterior of the chain for movement around the sprocket gears whereby the projection moves into a path parallel to the guide member as it moves around the lower sprocket gear and moves out of a path parallel to the guide member as it moves around the upper sprocket gear thereby engaging with and disengaging from the display assembly, said guide member being in the form of a vertically disposed guide rod, said guided member on the display assembly including a vertically disposed sleeve slidably mounted on the guide rod, said sleeve including a projecting lip on the upper end thereof disposed in the path of movement of the projection on the endless chain, the portion of the sleeve opposite to the lip having a projecting pin, said display assembly including a figurine connected to the pin, and vertical, laterally spaced guide plates paralleling the guide rod and receiving the projecting pin therethrough for preventing swinging movement of the sleeve and figurine about the vertical axis of the guide rod thereby maintaining the projecting lip on the sleeve in position for engagement by the projection on the endless chain.

3,916,549
PICTURE FRAME

Max H. Storch, Lawrence, and Clifford Storch, Great Neck, both of N.Y., assignors to Astorloid Manufacturing Co., Inc., Brooklyn, N.Y.

Filed Mar. 26, 1973, Ser. No. 345,021
Int. Cl.² G09F 1/12
U.S. Cl. 40—152.1 5 Claims

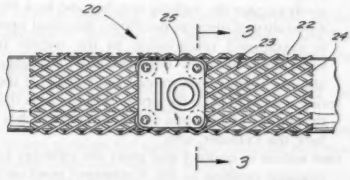


1. A picture frame arrangement comprising, in combination, a supporting member having a picture-viewing area formed as a cut-out in said supporting member, said supporting member including a recessed ledge shaped portion in said supporting member and extending along said cut-out on the rear surface of said supporting member to provide a predetermined location in said supporting member for a picture; a decorative member secured to said supporting member wholly within the periphery of said supporting member, said decorative member having a portion extending along said cut-out against the surface of said supporting member and bent portions at right angles to said portion extended along said cut out, said bent portions lying against the internal surface of the cut-out of the supporting member for providing a shadow-box effect for the picture frame, and tab portions projecting from the bent portions of the decorative member, the tab portions being bent at right angles to said bent portions and bearing against the recessed ledge-shaped portion in said supporting member, and auxiliary recesses provided in said ledge shaped portion for retaining said tab portions therein so that the external surface of said tab portions is flush with the surface of said ledge-shaped portion, and track means carried by said supporting member for supporting a picture against said recessed ledge.

3,916,550
ANIMAL MARKER

Theodore Dzus, West Islip, N.Y., assignor to Dzus Fastener Co., Inc., West Islip, N.Y.

Filed May 30, 1974, Ser. No. 474,666
Int. Cl.² G09F 3/00
U.S. Cl. 40—300 3 Claims



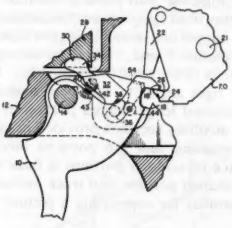
1. An expandable animal identification marker comprising: an integral deformable resilient tubular lattice of flexible

plastic material in the shape of a tube, the tubular lattice being of a predetermined diameter when in the relaxed condition and being responsive to pressure to deform into a tubular configuration of increasing inner diameter while tending to return to the relaxed position so that when the tube is slightly enlarged and placed on a portion of an animal it will remain in position thereon with the assistance of the lattice tending to return to the relaxed condition gripping the surface to which it is applied and as the animal grows the lattice will automatically deform and expand accordingly, the plastic of the lattice being of the type where a predetermined minimum amount of pressure is exerted when it attempts to return to its relaxed condition thereby avoiding deleterious effects on the animal while retaining the lattice in position on the animal, the tubular lattice having an identification marking mounted thereon to designate a specific animal, the tubular lattice being formed of two layers of strips of flexible plastic with each layer having its strips extending substantially parallel to one another and extending at an angle to the strips of the other layer, the strips of one layer being integrally connected to strips of the other layer at each point of intersection to prevent displacement of one strip with respect to another beyond the natural deformation ability of the plastic material so that when pressure is applied from within the tube against the plastic, the strips will deform and the inner diameter of the tubular lattice will increase and when the pressure is released the tubular lattice will tend to return to the relaxed configuration with the smaller inner diameter.

3,916,551
CYLINDER LOCK FOR DOUBLE ACTION REVOLVER

Robert E. Domian, Tolland, Conn., and Nicholas Sophinos, Long Meadow, Mass., assignors to Colt Industries Operating Corporation, Hartford, Conn.

Filed Mar. 7, 1974, Ser. No. 449,199
Int. Cl.² F41C *1/00*
U.S. Cl. 42—67 **3 Claims**

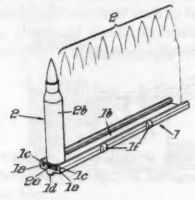


1. In a double action revolver, the combination comprising:
a frame;
a trigger mounted upon the frame for rearward pivoting movement about a first axis between extended and depressed positions;
a cylinder, having a plurality of locking notches on the periphery thereof mounted for rotation upon the frame;
a cylinder lock, having a projection thereupon to successively engage the locking notches and lock the cylinder in a plurality of discrete positions, mounted upon the frame in juxtaposed relationship to the trigger for pivoting movement between engaged and disengaged positions about a second axis spaced rearwardly of the first axis;
spring means to urge the projection towards the cylinder so that it may engage one of the locking notches and thereby lock the cylinder; and
cam means to contact and pivot the cylinder lock from the engaged position to the disengaged position during rearward movement of the trigger from the extended position and to subsequently contact and pivot the cylinder lock from the disengaged position to the engaged position during further rearward movement of the trigger so as to supplement the urging of the spring means and thereby prevent cylinder throw-by.

3,916,552
CARTRIDGE CLIP AND A MACHINE FOR FILLING THE CLIP WITH CARTRIDGES

Paul Pichard, and Lucien Corbin, both of Le Mans, France, assignors to ETAT FRANCAIS, Paris, France

Filed Mar. 18, 1974, Ser. No. 452,263
Claims priority, application France, May 25, 1973, 73.19023
Int. Cl.² F41C *27/00*
U.S. Cl. 42—87 **9 Claims**

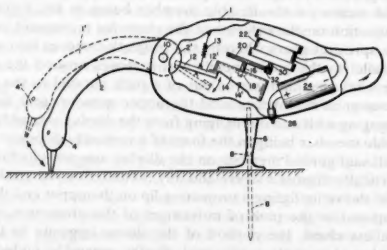


1. A unitary cartridge clip of deformable resilient material, comprising:
an elongated channel-shaped body for receiving rim ends of cartridges to be held in the clip, said body having a base and a pair of longitudinal side walls, the free end of each said longitudinal side wall being formed with a longitudinal flange;
said flanges extending substantially parallel to the base of said body and inwardly of said body for engaging in a groove provided adjacent the rim end of each cartridge and gripping said rim;
the longitudinal side walls of said body being sufficiently resiliently flexible to constitute means for transverse spreading apart of the flanges to enable the rim ends of the cartridges to be introduced into the clip in a direction transverse to said body until the flanges snap into said groove;
and said base including means for rigidifying the base of said body in the longitudinal direction while concurrently permitting said transverse spreading of the flanges.

3,916,553
DECOY

Howard M. Lynch, 2810 Halcyon Ave., Baltimore, Md. 21214, and Thomas L. Thomas, 424 Drew St., Baltimore, Md. 21224

Filed Feb. 1, 1974, Ser. No. 438,678
Int. Cl.² A01M *31/06*
U.S. Cl. 43—3 **3 Claims**



1. A decoy for wild fowl including a hollow body portion simulating a goose, including a head portion formed on one end of a neck portion wherein the opposite end of the neck

portion is attached to the forward end of the body and operating means for moving the head and neck portion in a vertical plane parallel with a vertical plane passing through the body portion, the improvement comprising:

a. said body portion having an opening adjacent its forward end adapted to hingedly receive the end of the neck opposite the head;

b. said neck portion having an aperture therethrough adjacent the end of the neck opposite the head, the aperture being perpendicular with the vertical plane passing through the the body and neck portion;

c. a pin extending through the aperture in the neck for supporting the same, and means associated with the body portion for supporting the ends of the pin to allow vertical movement of the neck and head members about the axis of the pin relative to the body portion;

d. a stem rigidly fixed to the portion of the neck extending beyond the opposite side of the pin from the head supporting portion and in a vertical plane with the neck and said head;

e. a rotatable cam adapted to rotate in a plane substantially parallel with the axis of the stem, the outer edge of the cam surface extending perpendicular to the axis of the stem and over the outer end thereof, said cam surface being such as to move the outer end of the stem in a limited arc about the neck supporting pin as the cam is rotated, thereby moving the neck and head of the decoy in a vertical plane to simulate the feeding of the fowl, and means for rotating the cam.

3,916,554

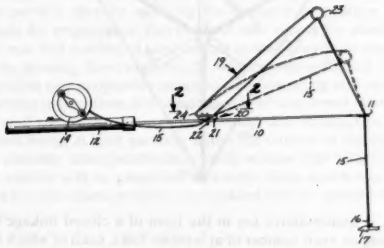
ANGLERS ACCESSORY

Joseph E. Hullett, Rte. 5, Prior Lake, Minn. 55372

Filed July 12, 1974, Ser. No. 488,043

Int. Cl.[2] A01K *97/12*

U.S. Cl. 43—17 **4 Claims**



1. An anglers' accessory comprising in combination:

a base member having a flat surface;

a bifurcated resilient member for removably and adjustably securing said base member to a fishing rod;

a bite signaling element secured to said base member and comprising a resilient member extending from said base at an angle thereto and having a quick-thread line guide at its end remote therefrom;

and means secured to said base for releasably and frictionally gripping a line passing to said line guide.

3,916,555

TROLLING APPARATUS

William M. Booth, Grand Haven, and James E. Rieth, Grand Rapids, both of Mich., assignors to James E. Rieth, Grand Rapids, Mich.

Filed July 24, 1972, Ser. No. 274,505

Int. Cl. A01k *89/00;* **B65h** *75/44*

U.S. Cl. 43—27.4 **11 Claims**

1. A deep trolling apparatus adapted for mounting to a boat to pay out and retrieve a weighted control line to which a fishing line is attached and thereby controllably positioned in the water comprising:

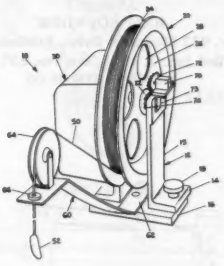
a reel frame;

a line reel rotatably mounted to said frame and having a peripheral channel for holding a line therein;

line guide means coupled at one end to said reel frame and extending therefrom;

a control line anchored at one end to said reel and guidably supported by said guide means as it is extended and retracted to and from said reel;

weighted means attached to the opposite end of said control line for releasably securing a fishing line to said control line;



a reversible electrical drive motor;

gear means coupling said reversible drive motor to said reel, and wherein said gear means has a gear ratio between said motor and said reel such that when said drive means is not actuated, said reel is securely held in position to hold said line at a predetermined selected position; and

means for selectively actuating said drive motor to extend and retract said line from said reel, said actuating means including switch means and means for biasing said switch means to a stable, normally off position, said switch means being movable to first or second unstable positions against the force of said biasing means to apply first or second signals to said reversible drive motor to extend or retract said line, respectively.

3,916,556

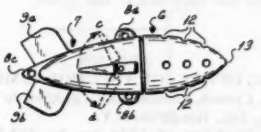
MULTIPURPOSE FISHING DEVICE

Frank Armanno, 7 Gemini Lane, Nesconset, N.Y. 11767

Continuation-in-part of Ser. No. 457,624, April 3, 1974, abandoned. This application Nov. 18, 1974, Ser. No. 524,644

Int. Cl.[2] A01K *85/00*

U.S. Cl. 43—42.06 **1 Claim**



1. A multipurpose fishing device comprising, in combination:

a. a body portion including a perforated forward section that is adapted to function as a bait chamber and a fluid impermeable rearward section that is adapted to function as a ballast chamber;

b. means for removably securing said forward and said rearward sections to each other;

c. means transversely interposed between said forward and said rearward sections for sealing and isolating said rearward section from said forward section;

d. a plurality of fins mounted on the external surface of said rearward section; at least some of said fins being adjustably positioned and said adjustably positioned fins are comprised of a fixed section and a movable section and

a clevis joint coupling said two sections there being further included a compression spring having a first end bearing against said fixed section and a second end bearing against said movable section and include means for securing said adjustable fins in any one of a plurality of different positions;

e. means for attaching at least one hook to said rearward section; and

f. piston means in said forward section for selectively discharging the contents thereof.

3,916,557

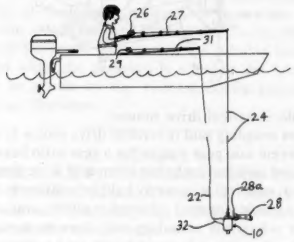
BAIT SOUNDER

Van L. Taylor, 932 Mountain Drive, Fultondale, Ala. 35068

Filed Jan. 2, 1975, Ser. No. 537,933

Int. Cl.[2] A01K *95/00*

U.S. Cl. 43—43.12 **8 Claims**



1. In a bait sounder for lowering bait attached to a fishing line in water,

a. a heavy body of a weight to sink in water and having a first clamp element disposed to engage said fishing line,

b. a movable member operatively connected to said body and having a second clamp element disposed to cooperate with said first clamp element to releasably clamp said fishing line therebetween,

c. means urging said movable member and said second clamp element toward said first clamp element, and

d. a control line connected to said movable member for moving said second clamp element away from said first clamp element to release said fishing line after the fishing line and said body sink in said water.

3,916,558

COUPLING DEVICE FOR A SECTIONAL MINNOW TRAP

Lindsley B. Crouch, Fillmore, N.Y., assignor to Cuba Specialty Mfg. Co., Inc., Houghton, N.Y.

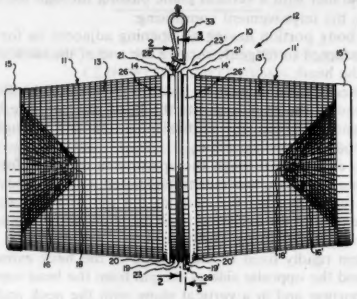
Filed Dec. 18, 1974, Ser. No. 533,858

Int. Cl.[2] A01K *69/06*

U.S. Cl. 43—65 **6 Claims**

1. In a sectional minnow trap including two halves, the improvement comprising an improved coupling device for releasably joining said halves, said device including: a first ring mounted on one of said halves and having a first annular end face; a second ring mounted on the other of said halves and having a second annular end face; each of said rings provided with a radially extending through slot at one circumferential location, and having a hook member arranged at another location diametrically opposite said one location, each of said hook members having a leg portion extending longitudinally beyond the end face of its ring and having a hook portion extending away from said leg portion in longitudinally spaced relation to the end face of its ring,

whereby said hook portion of each of said rings may be simultaneously inserted through the slot in the other of



said rings to releasably join said halves such that said first and second end faces may face one another.

3,916,559

VORTEX LINKAGES

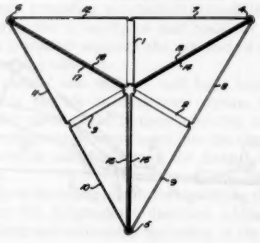
Frederick George Flowerday, 42, Granville Road, London, N12 OHJ, England

Filed Aug. 12, 1974, Ser. No. 496,881

Claims priority, application United Kingdom, Aug. 23, 1973, 39910/73

Int. Cl.[2] A63H *33/00*

U.S. Cl. 46—1 R **10 Claims**



1. A manipulative toy in the form of a closed linkage containing an even number of at least six links, each of which links comprises a central limb with two end limbs projecting one from each end thereof in planes mutually perpendicular to one another, means pivotally joining said links such that each end limb of each said link is journalled alongside an end limb of an adjacent one of said links so that mutually adjacent links pivot generally coaxially with respect to one another and enable the linkage to be successively turned inside out through a position in which it defines a planar polygon, in which position half the journalled pairs of limbs stand perpendicular to the plane of the polygon at each vertex thereof whilst the remaining journalled pairs of limbs lie in the plane of the polygon and project from the mid points of the sides of the polygon towards the centre thereof.

3,916,560

MINIATURE AIRCRAFT AND LAUNCHER UNIT THEREFOR

Joseph T. Becker, 2 S 214 Sheffield, Glen Ellyn, Ill. 60137

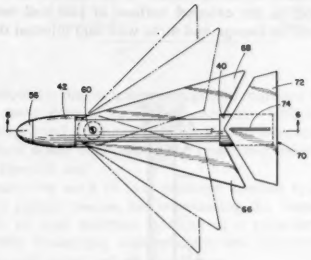
Continuation-in-part of Ser. No. 438,856, Feb. 1, 1974. This application Sept. 6, 1974, Ser. No. 503,858

Int. Cl.[2] A63H *27/00, 27/14*

U.S. Cl. 46—80 **8 Claims**

1. A combination flight vehicle and launching apparatus comprising, in combination, a flight vehicle having a vehicle

body with front and rear end portions, and including wings extending laterally outwardly from said vehicle body, means disposed adjacent said front portion of said flight vehicle and presenting a rearwardly directed surface for engaging the free end of an elastic propulsion device, a launcher assembly having a base portion and a tower element extending vertically a substantial distance from said base portion, means releasably attaching said rear end portion of said flight vehicle body to said launching apparatus in the vicinity of said base portion thereof, an extensible elastic propulsion member having a fixed end attached to a part of said tower element at a point which is spaced a substantial distance above said launcher base and having a free end releasably engaging said reawardly directed propulsion-engaging means on said front portion of said flight vehicle, said propulsion member having a length so



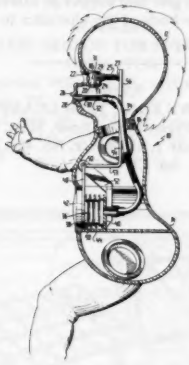
as to be tensioned substantially when extended and the free end thereof is engaged with said propulsion engaging means of said vehicle and said rear end portion of said vehicle body is attached to said launching apparatus in the vicinity of said base portion thereby enabling the operator to position said vehicle for engagement therewith of said means for attaching said rear end portion of said vehicle to said launching apparatus by pressing downward on the vehicle with sufficient force to tension said propulsion member while engaging said vehicle attaching means from the opposite side of said tower element, and said means for releasably attaching said vehicle rear end portion being at least partially under the control of the operator, whereby, the operator may safely release said vehicle and said vehicle will be propelled upwardly along said tower element by said elastic member and guided into an upward flight path.

3,916,561
TOY KISSING DOLL

Kosei Kato, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed July 10, 1974, Ser. No. 487,223
Claims priority, application Japan, Oct. 31, 1973, 48-126826[U]
Int. Cl.[2] A63H 5/00
U.S. Cl. 46—118 **4 Claims**

1. A toy doll that interacts with body contact with the child to produce a kissing sound and eye movement, comprising a head, sockets provided within said head, eyes, means mounting said eyes to rotate within said sockets between open and closed positions, and lips defining an opening therebetween, a torso provideo with a flexible, enclosed bag therein, means normally urging said bag to its expanded position, a conduit provided with sound producing means operatively connecting said opening between said lips of said head and the interior of said bag, said sound producing means only producing a sound on the intake of air through said opening between said lips into said conduit, a button positioned along the surface of said torso for operation by the child, means operatively connecting said button to said bag and said eyes such that as the child depresses said button said eyes are rotated from said open to said closed position simultaneously with said bag being compressed to expel air therefrom at which time the child engages said lips of said doll closing said opening therebetween and thereafter gradually releases the engagement with said lips

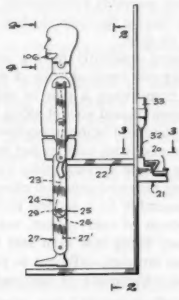


permitting air to move inwardly through said lips at which time said eyes rotate from said closed to said open position simultaneously with the operation of said sound producing means.

3,916,562
ANIMATED PUPPET

Robert Burkhart, 9856 Shirley Lane, Beverly Hills, Calif. 90210

Filed Nov. 14, 1974, Ser. No. 522,459
Int. Cl.[2] A63H 7/00
U.S. Cl. 46—119 **11 Claims**

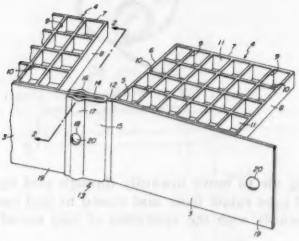


1. An animated puppet comprising:
a. A skeleton of rigid elements connected at movable joints,
b. control lines, at least one said control line connected to each pair of said rigid elements at each said joint, such that one said rigid element of said pair is forced to move around said joint with respect to the other member of said pair when said control line is pulled,
c. springlike devices, at least one said springlike device attached to each said pair of rigid elements connected by a joint near said joint, such that one said rigid element of said pair is forced by said springlike device to a predetermined neutral position with respect to the other element of said pair when said control line is relaxed,
d. pulleys, spacers and tubes attached to said skeleton by means of which each said control line is guided from said

joint, which said control line controls, to the operator, such that the operator may pull each said control line independently,

e. interchangeable, segmented shells of lightweight material, such that said segmented shells can be attached to said skeleton to give said puppet an external shape corresponding to the body of the character to be depicted by said puppet.

3,916,563
LAWN EDGE TRIM GUARD
George E. Tedesh, Pegan Lane, Dover, Mass. 02030
Filed July 1, 1974, Ser. No. 484,701
Int. Cl.[2] A01G *1/08*
U.S. Cl. 47—33 **3 Claims**



1. A lawn trim guard comprising;

a. a first guard assembly comprising a vertical imperforate plate, the vertical depth of said plate being greater than the root propagating depth of lawn grass;

b. a grid attached to and extending along the upper edge of said plate, said grid comprising transverse and lateral slats forming a plurality of cells open at the top and bottom, the depth of said cells being less than said root propagating depth;

c. a second guard assembly substantially like said first guard assembly and having its vertical plate extending horizontally beyond its grid;

d. said first guard assembly having an elongated socket attached along one vertical edge of its vertical plate;

e. said socket comprising a pair of side plates extending from the bottom of said socket along the entire height of said vertical plate and being imperforate for a first predetermined distance from said socket bottom;

f. the extension of the vertical plate of said sceond guard assembly being received into said elongated socket of said first quard assembly to a second prdetermined distance from the bottom of said socket, said second predetermined distance being less than said first predetermined distance by an amount sufficient to permit relative vertical rotational adjustment of said extension within said socket; and

g. detent means for retaining said extension in said socket in each position of its vertical adjustment.

3,916,564
ROOT TREATING DEVICE
Edward G. Crowell, Sr., 6418 Cindy, Houston, Tex. 77008
Filed Sept. 4, 1973, Ser. No. 393,957
Int. Cl.[2] A01G *29/00;* **A01C** *23/02;* **E21B** *11/02*
U.S. Cl. 47—48.5 **1 Claim**

1. A root treating device comprising:

a. an elongate, substantially tubular housing means having first and second axially spaced ends;

b. rod means adapted to be removably carried within and closely surrounded by said housing means, said rod means having first and second axially spaced ends;

c. a connector adjacent said second end of said housing means for securing said housing means to a fluid supply means when said rod means is removed whereby fluid supplied from said supply means may flow through said housing means;

d. tapered end surface means provided on said first end of said rod means adapted to extend axially beyond said first end of said housing means for assisting in inserting said rod means and surrounding housing means into soil;

e. releasable securing means adjacent said second end of said rod means and adapted to engage and cooperate with said connector for releasably securing said housing means and said rod means together;

f. internal threads included in said connector with said connector being rotatably carried adjacent said second end of said housing means;

g. releasable securing means including external threads carried on the external surface of said rod means and adapted to engage and mate with said internal threads in said connector, said rod means being of greater axial development than said housing means and said external threads being disposed at a point on said rod means whereby said first end of said rod means extends axially beyond said first end of said housing means when said external and internal threads are connected together;

h. externally threaded covering means having threads adapted to mate with the internal threads in said connector for enclosing said housing when said rod means is removed, said rod means including an internally threaded recess adapted to mate with the threads on said covering means for storing said covering means when not in use to enclose said housing means; and

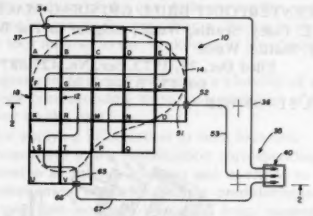
i. axially and radially extending flange means connected to the outer surface of said housing means for preventing rotation and upward movement of said device in the soil, said flange means tapering inwardly in a direction from said second end of said housing means toward said first end of said housing means.

3,916,565
ROOTING MATRIX SYSTEM
Larry K. Runyon, Kansas City, Mo., assignor to Techway, Inc., Hutchinson, Kans.
Filed Feb. 26, 1973, Ser. No. 335,592
Int. Cl.[2] A01B *79/00;* **E02B** *13/00*
U.S. Cl. 47—58 **4 Claims**

1. A method for controlling water drainage from a golf green having a plurality of discrete surface areas of varying elevation to selectively provide for control of drainage of

water applied to said surface areas, thereby promoting optimum and substantially uniform overall surface conditions of said golf green, said method comprising:

1. placing generally beneath each of said discrete areas a subsurface moisture barrier adapted to prevent surface water applied to the surface of each said area from draining to a level below the barrier provided for said area;



2. interconnecting at least some of said moisture barriers of the same general subsurface elevation with a common underground drainage conduit system adapted to drain surface water collected in the respective moisture barriers thereof; and
3. connecting each of said drainage conduit systems with level control means for maintaining the water level in each of said moisture barriers at a preselected level, thereby promoting said optimum and substantially uniform golf green surface conditions.

3,916,566

FIRE DOOR STRUCTURE AND FIRE SAFETY INSTALLATION INCLUDING SAID DOOR STRUCTURE

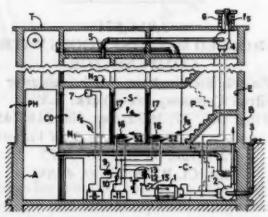
Jean-Pierre Charles Lacombe, 148 Chemin de Versailles, 92 Rueil-Malmaison, France

Filed Feb. 21, 1973, Ser. No. 334,485

Claims priority, application France, Feb. 22, 1972, 72.05827; Feb. 9, 1973, 73.04608

Int. Cl.[2] E05F *15/20*

U.S. Cl. 49—7 **9 Claims**



1. A fire door structure comprising a door frame, a door movably mounted on said frame, means for resiliently biasing the door in a direction to close the door, the door having an opening therein allowing passage through the door structure, a movable flap for selectively opening and closing the opening, locking means for normally securing the flap to the door in the closed position of the flap and sensitive to a remote fire detection means for releasing the flap from the door in the event of a start of a fire so as to permit the flat to open said opening and to evacuate smoke therethrough, first resiliently yieldable means for biasing said flap to the closing position of the flap, second resiliently yieldable means which are more powerful than the first resiliently yieldable means for biasing the flap to the opening position of the flap, and fuisible means proximate the door thereby allowing said second resiliently yieldable means to open the flap under the control of said remote fire detection means and said first resiliently yieldable means to close the flap when the second resiliently yieldable means is disabled as the temperature close to the door rises to a predetermined level so as to isolate both sides of the door with respect to fire propagation.

3,916,567

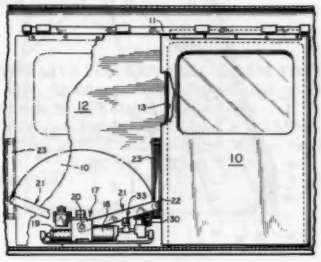
OBSTRUCTION SENSOR FOR PNEUMATIC DOOR OPERATOR

Kristupas Daugirdas, Wilmette, Ill., assignor to Vapor Corporation, Chicago, Ill.

Filed Aug. 26, 1974, Ser. No. 500,575

Int. Cl.[2] E05F *15/06*

U.S. Cl. 49—28 **9 Claims**



1. In a system for operating a door between open and closed positions and reversing a door closing cycle upon sensing an obstruction at the door, a differential pneumatic door engine having large and small cylinders and an output shaft driven by the cylinders and drivingly connected to the door, an air supply, means connecting the air supply directly to the small cylinder, an electrically operable valve for selectively interconnecting the large cylinder to the air supply to close the door or to atmosphere to open the door, flow control means between the air supply and the large cylinder, a normally open pressure switch monitoring the pressure in the large cylinder and responding to an obstruction encountered by the door, a reversing cycle relay having contacts for operating the valve to interconnect the large cylinder to atmosphere, and said pressure switch having contacts for operating said relay to close the valve contacts and cause the valve to interconnect the large cylinder to atmosphere for a door opening cycle, wherein said pressure switch and said flow control means coact with each other to respond to a predetermined pressure in the large cylinder caused by an obstruction encountered by the door.

3,916,568

SANDBLAST MACHINE

James J. Rose, Sylmar, and Edward L. Horton, San Gabriel, both of Calif., assignors to Enviro-Blast International, Los Angeles, Calif.

Continuation-in-part of Ser. No. 483,357, June 26, 1974, abandoned, which is a continuation of Ser. No. 360,192, May 14, 1973, abandoned. This application Oct. 29, 1974, Ser. No. 518,579

Int. Cl.[2] B24C *3/06*

U.S. Cl. 51—8 R **37 Claims**

1. In an apparatus to sandblast a surface, the combination of:

support structure,

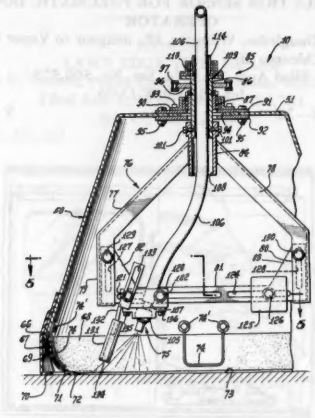
said support structure including a first bearing having its axis substantially normal to said surface;

rotatable structure having a tubular portion rotatable in said bearing to support the rotatable structure;

a sandblast nozzle;

a second bearing on the rotatable structure rotatably embracing the sandblast nozzle to permit relative rotation between the nozzle and the second bearing, the second bearing directing the nozzle towards said surface;

power means to actuate the rotatable structure about said axis,



said second bearing being spaced from said axis to carry the nozzle along an arcuate path in response to rotation of the rotatable structure; and

a hose to supply the nozzle,

a portion of the hose extending through said tubular portion of the rotatable structure along said axis with an end portion of the hose diverted from the axis to the blast nozzle in the second bearing.

3,916,569

METHODS OF AND MEANS FOR PRODUCING HELICALLY TOOTHED GEARS

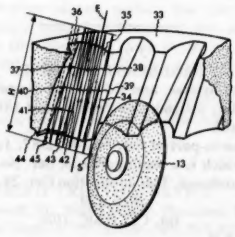
Robert Wydler, Zurich, and Gerd R. Sommer, Dietikon, both of Switzerland, assignors to Maag Gear Wheel & Machine Company Limited, Switzerland

Filed Mar. 21, 1974, Ser. No. 453,492

Claims priority, application Switzerland, Mar. 26, 1973, 4317/73

Int. Cl.[2] B23F *9/02*

U.S. Cl. 51—33 W **8 Claims**



1. A method for producing a helically toothed internal involute gear by the generating process employing longitudinal grinding techniques comprising the steps of effecting relative movement between a grinding tool and said gear substantially in the direction of the tooth depth for generating and feed displacements, effecting grinding strokes with said tool substantially along the direction of the gear face width by guiding said tool along a path that causes an active grinding point of said tool to follow a straight generatrix of the involute helical tooth surface, and deflecting said tool from said path in a predetermined manner immediately before the tool reaches the tooth root surface.

3,916,570

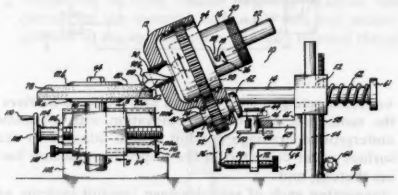
CENTERPOINT DRILL GRINDING MACHINE

Lloyd E. Caley, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 21, 1973, Ser. No. 427,387

Int. Cl.[2] B24B *3/26*

U.S. Cl. 51—95 WH **7 Claims**



1. A drill pointing machine to impart a conic centerpoint, the combination comprising: a drill supporting structure, a driven grinding wheel having a pair of contiguous grinding surfaces subtending an obtuse angle at a sharp line of demarcation; means for providing relative movement between the drill and the grinding wheel along a line parallel with the topmost grinding surface; means for reciprocally advancing and retracting the drill along a line parallel to the topmost grinding surface with the drill held in a bushing at a predetermined angle to simultaneously grind the flutes and a circular cross sectional centerpoint cone on the end of the web, said means providing for an advance, a retraction, and a pause in the retracted position during each one-half of each revolution by the drill; means for holding the drill in the retracted position for final polish of the cone; and means for variably adjusting the duration of the pause.

3,916,571

CAM CONTROLLED MACHINE TOOLS WITH CONTOUR COMPENSATOR

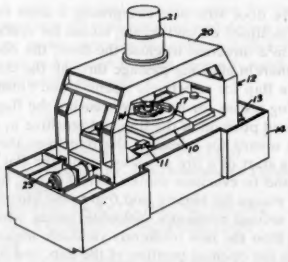
William B. Seidel, Birmingham, Mich., assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed Dec. 27, 1972, Ser. No. 318,745

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl. B24B *17/00, 49/00*

U.S. Cl. 51—101 R **5 Claims**



1. In a machine tool, the combination comprising

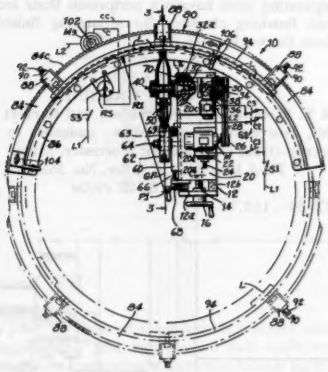
means for supporting a workpiece,
a tool,
means for supporting the tool for movement relative to the workpiece,
a cam,
a cam follower,
means controlled by the cam follower for moving the tool and the workpiece relative to one another in accordance with the position of the cam follower on the cam,
programmable means for providing a change in movement of the tool relative to the workpiece at any desired point on the cam,
said programmable means including a plurality of memory locations corresponding to varying positions of the cam follower on the cam,
means for applying information to each location,
means responsive to the imformation corresponding to the information at another location and operable to prevent the information which exceeds a predetermined value from said first-mentioned location from passing to the means for controlling the relative positions of the workpiece and tool.

3,916,572

APPARATUS FOR GRINDING CONCAVE SURFACES TO CONSTANT PRIMARY AND SECONDARY RADII

Loring Coes, Jr., Princeton, Mass., assignor to Norton Company, Worcester, Mass.

Filed July 27, 1974, Ser. No. 446,468
Int. Cl.² B24B *13/02*
U.S. Cl. 51—105 LG **10 Claims**



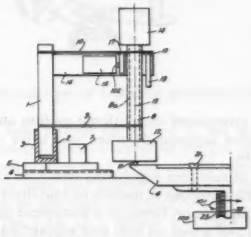
1. Apparatus for grinding concave surfaces of lens blanks to constant primary and secondary radii comprising:
a wheel support;
a wheel spindle on the wheel support;
a radially adjustable grinding wheel, expandable from a predetermined initial minimum radius to a maximum radius, attached to the wheel spindle for rotation about an axis of rotation situated in a first plane and in a grinding plane situated at substantially right angles to and intersecting the first plane and having
a peripheral abrasive surface thereon rotatable in and movable in the grinding plane relative to the axis of rotation to a desired secondary radius between the minimum radius and the maximum radius for grinding the secondary radius;
wheel drive means on the wheel support for rotating the grinding wheel at a grinding speed;
wheel feed means for moving the grinding wheel and the peripheral abrasive surface relative to and into the lens blanks along the grinding plane to and away from a predetermined final grinding position at which the concave surfaces of the lens blanks are ground to the desired constant secondary and primary radii;
a radially adjustable work holder, adjacent the peripheral abrasive surface of the grinding wheel, movable in the first plane situated at substantially right angles to and intersecting the grinding plane and at a desired constant primary radius from and about a center situated at an intersection of the grinding and first planes for supporting and guiding the lens blanks at the desired constant primary radius about the center; and
work drive means for moving the work holder and the lens blanks thereon relative to the grinding wheel at the desired constant primary radius in the first plane across the peripheral abrasive surface of the grinding wheel to simultaneously grind the primary and secondary radii on the lens blanks.

3,916,573

APPARATUS FOR GRINDING A GEM STONE

Maximo Elbe, Hamburg, Germany, assignor to Colorant Schmuckstein GmbH, Hamburg, Germany

Division of Ser. No. 361,037, May 17, 1973, Pat. No. 3,886,695. This application Mar. 12, 1975, Ser. No. 557,666
Int. Cl.² B24B *9/16*
U.S. Cl. 51—118 **9 Claims**



1. In a machine for grinding and polishing of gem stones, particularly diamonds, a combination comprising a grinding disc mounted for rotation in a substantially horizontal plane; a first upright mounted laterally of said grinding disc and being adjustable in vertical direction; a second upright paralleling said first upright and having a lower end located above said plane and said grinding disc and being adapted to carry a gem stone; connecting means connecting said second upright with said first upright for vertical movement of the former with reference to said plane; first drive means for turning said second upright about an upright axis intersecting said plane; second drive means for advancing said lower end toward and retracting it from said plane in upright direction, whereby to effect and terminate contact of said gem stone with said grinding disc; first sensing means for sensing the distance through which said lower end advances towards said plane in said upright direction; and thermally responsive second sensing means for sensing fluctuations in the temperature of the gem stone, and operatively associated with said second drive means for controlling operation of the same in such a manner that said temperature will become and remain constant.

3,916,574

LENS SURFACING APPARATUS

Louis Prunier, Oxford, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Nov. 29, 1974, Ser. No. 528,298
Int. Cl.² B24B *7/00, 9/00*
U.S. Cl. 51—124 L **10 Claims**

1. In lens surfacing apparatus including a rotatable tool supporting structure, means for rotating said structure, work

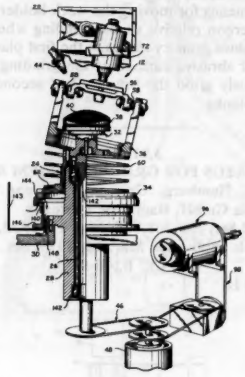
harnessing means rotatable with said tool supporting structure and a workpiece actuating head having a drive pin, the improvement comprising:

means for fixedly mounting said drive pin in said head;

a tool holder in said tool supporting structure;

a drive unit remote from said head for producing a compound cranking motion and means for actuating said unit;

rocker means interconnecting said drive unit and head for effecting conversion of said compound cranking motion



into a compound oscillational motion and for oscillating said head accordingly when said drive unit is actuated; whereby

rotation of said tool supporting structure and work harness with simultaneous actuation of said drive unit produces a surfacing motion between a workpiece in said harnessing means and a tool on said tool supporting structure which surfacing motion includes oscillation of said workpiece over said tool with a continuous breakup of its oscillational movement.

3,916,575

VIBRO-GYRATORY FINISHING MACHINES

David Cunningham Smith, Stoke on Trent, England, assignor to William Boulton Limited, Staffordshire, England

Continuation-in-part of Ser. No. 439,186, Feb. 4, 1974, abandoned, which is a continuation of Ser. No. 2,857, Jan. 14, 1970, abandoned. This application Mar. 10, 1975, Ser. No. 556,849

Claims priority, application United Kingdom, Feb. 15, 1969, 8324/69

Int. Cl.² B24B *31/00*

U.S. Cl. 51—163 **7 Claims**

1. A vibro-gyratory finishing apparatus including:

a. a finishing chamber of annular shape in plan adapted to contain a charge of workpieces to be finished, said chamber having a bottom and opposing side walls,

b. means for subjecting the chamber to a vibratory action in the form of a high frequency rotary oscillation about a vertical axis with an upward and downward component in the movement,

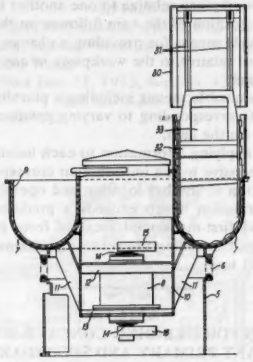
c. vertical guide channels in opposite side walls of said finishing chamber,

d. a dam or weir in the form of a plate vertically slidably mounted within said guide channels,

e. power means located above said finishing chamber and attached to opposite edge regions of the dam-forming plate leaving a gap at the central region to allow passage of the charge over the top of the dam between the attachment points,

f. the power means being operable to move the dam between a raised portion in which the dam is clear of said chamber and permits progression of the charge around said chamber and a lowered position in which the dam is disposed within and across said chamber to cause the charge to rise up and over the central region of the dam,

g. the height of the dam being arranged such that in its lowered position the top edge of the dam is at substan-



tially the same level as the top edge of the chamber; and

h. discharge means rigidly mounted on top of the chamber and positioned to co-operate with the dam when the latter is in its lowered position so as to receive the charge moving over the dam, said discharge means including a separating zone having a perforated floor located over said finishing chamber for separating finishing media from the workpieces.

3,916,576

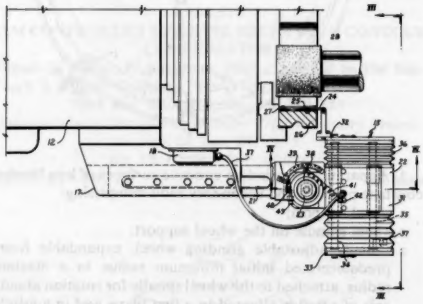
GRINDING MACHINE

Alfred T. Blackburn, West Boylston, and Herbert R. Uhtenwoldt, Worcester, both of Mass., assignors to Cincinnati Milacron-Heald Corporation, Worcester, Mass.

Filed June 11, 1973, Ser. No. 368,631

Int. Cl.² B24B *49/04*

U.S. Cl. 51—165.74 **7 Claims**



1. A grinding machine for finishing a surface of revolution on a workpiece, comprising

a. a base,

b. a workhead mounted on the base and having means for holding the workpiece and rotating it about the axis of the said surface of revolution,

c. a gage bracket mounted on the workhead,

d. a gagehead mounted on the bracket and having a finger to engage the said surface of the workpiece, the gagehead being movable in a first mode relative to the bracket due to changes in the radial distance between the surface of

the workpiece and the said axis, the gagehead being mounted on the bracket for pivotal movement about a transverse axis with an over-center spring which is operative between the head and bracket to hold them either in a first position in which the finger engages the workpiece or in a second position in which the finger is removed from the workpiece a substantial distance,

e. means operative to cause relative movement in a second mode between the gagehead and bracket to remove the finger from the workpiece,

f. a transducer mounted to receive the movement in the first mode and convert it to digital pulses, and

g. a counter having a visual readout, the counter receiving the pulses from the transducer and producing a continuous algebraic summation which appears in the visual readout.

3,916,577

JOINT RETENTION CLIP FOR A BUILDING WALL STRUCTURE

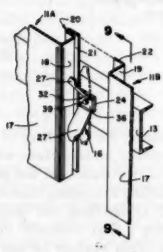
Bobby G. Vare, Milton, Ind., assignor to H. H. Robertson Company, Pittsburgh, Pa.

Filed Feb. 12, 1973, Ser. No. 331,557

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] E04C *2/08*

U.S. Cl. 52—489 **4 Claims**



1. In a joint between adjacent panels wherein said panels present confronting first and second side walls extending inwardly toward a supporting structure, a female lip extending laterally from the first side wall and inwardly of the panel, a male lip extending laterally from the second side wall into said female lip, the improvement comprising:

first means for securing said female lip to said supporting structure; and

second means for retaining said male lip engaged with said female lip, including at least one wing element extending outwardly from said supporting structure and presenting a longitudinal edge in confronting relation with a face of the second side wall which is remote from the first side wall, said wing element being flexible in a direction parallel with the second side wall and being relatively inflexible in a direction normal to the second side wall;

said female lip presenting a terminal flange portion extending laterally of said first and second side walls and inwardly of said second panel;

a base formed integrally with said wing element and engaged with said terminal flange portion; and

said first means for securing said female lip to said supporting structure comprising a fastener extending through said base and said terminal flange portion.

3,916,578

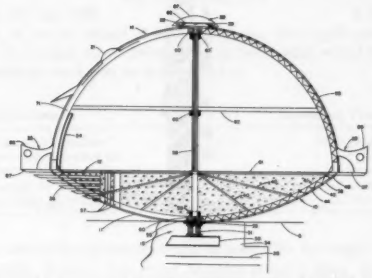
EARTHQUAKE-PROOF BUILDING STRUCTURE

Iradj Forootan, 4215 Dover St., Wheat Ridge, Colo. 80033, and Manouchehr Foroutan, No. 73, Yuse-f-abad, Mostofi Ave., Teheran, Iran

Filed May 24, 1971, Ser. No. 146,137

Int. Cl.[2] E04H *9/02*

U.S. Cl. 52—167 **1 Claim**



1. An earthquake-proof building structure comprising in combination:

a concrete base footing embedded in the ground having superimposed I-beams embedded therein and a series of steel support plates stacked on said I-beams, and a resilient pad between said support plates and the concrete;

a solid, heavyweight base composed of reinforced concrete being in the form of a sphere less than a hemisphere having a relatively flat surface and a round undersurface resting on the support plates of said base footing even with the ground surface so that said building is capable of being lifted, tipped or swayed;

a hollow upper shell affixed to the upper and outer periphery of said base, having outer wall sections, a plurality of window openings and separate ventilating panels disposed at spaced intervals in the wall of said shell, entry doors, and a stairway extending downwardly from the entry doors into said shell along the external surface of said base to the ground level;

said base having a radius of curvature being greater than that of said upper shell and the weight of said base in relation to that of said shell being such that the center of gravity of the building structure is located within said base;

said base and shell each including radially extending circumferentially spaced steel reinforcing beams extending from the upper and lower center portions of said shell and base, respectively, and curving outwardly for connection at the juncture of said base and shell;

said reinforcing members being defined by a pair of inner and outer generally T-shaped beams in which the stem portions of said beams face inwardly toward one another and girder members extend at relative low angles between said inner and outer beams and rigidly interconnect said beams;

said girders being generally L-shaped in cross-section and being permanently attached to the cross portions of said T-shaped beams; and

the joint formed at the juncture of each of said reinforcing members for said base and shell having reinforcing plates interconnecting adjoining ends of said reinforcing members.

3,916,579
SLOTTED ABRASIVE WHEEL

Gustav Martin Waller, Geneva, and Kenneth L. Landmark, St. Charles, both of Ill., assignors to Tunco Manufacturing Inc., Geneva, Ill.

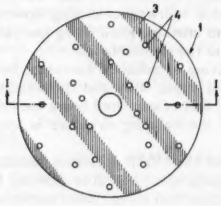
Filed Feb. 10, 1975, Ser. No. 548,773
Int. Cl.² B24D *5/02, 5/10*
U.S. Cl. 51—206 P **6 Claims**

1. A grinding wheel having opposed faces and a peripheral abrasive coated grinding surface; a plurality of transverse slots in said peripheral surface, said slots being angularly disposed relative to the wheel axis and extending across the entire width of the peripheral surface; the wheel face, at the leading edge of each slot in the direction of wheel rotation, being recessed at said edge for approximately the full radial depth of the slot so as to provide increased air flow through the slots as the wheel rotates.

3,916,580
FLAT GRINDING DISC

Harald Helletsberger, Wattens; Heinrich Ofer; Wilhelm Haidacher, both of Vomp, and Ernst Geissler, Schwaz, all of Austria, assignors to Tyrolit-Schleifmittelwerke Swarovski K.G., Schwaz, Austria

Filed May 31, 1974, Ser. No. 475,244
Claims priority, application Austria, June 8, 1973, 5106/73
Int. Cl.² B24D *7/04*
U.S. Cl. 51—209 R **4 Claims**

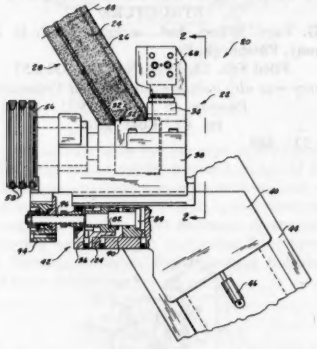


1. A flat grinding disc comprising:
a rigid disc-shaped grinding layer of an abrasive material formed of grinding grain, binding agent and filler, said grinding layer having a planar grinding surface and an opposite planar mounting surface spaced from said grinding surface;
a rigid securing layer formed of a rigid foamed plastics material, said securing layer having opposite spaced planar surfaces;
said securing layer at a first of said planar surfaces thereof being foamed into and rigidly secured to said mounting surface of said grinding layer; and
said securing layer having at a second of said planar surfaces thereof securing means for securing said grinding disc to a planar grinding machine.

3,916,581
METHOD FOR DRESSING GRINDING WHEELS

Francis L. Messier, Worcester, Mass., assignor to The Warner & Swasey Company, Cleveland, Ohio

Filed Nov. 29, 1973, Ser. No. 419,997
Int. Cl.² B24B *1/00*
U.S. Cl. 51—283 **5 Claims**



1. A method of dressing the periphery of a rotatable grinding wheel having a circular main surface which extends at an acute angle to the axis of rotation of the grinding wheel and a circular shoulder surface extending transversely to the main surface, said method comprising the steps of rotating the grinding wheel, moving a first rotatable dressing wheel into engagement with the main surface of the rotating grinding wheel, said step of moving the first dressing wheel into engagement with the main surface of grinding wheel includes the step of moving the first dressing wheel along a first path which intersects the main surface on the grinding wheel, said first path extending substantially perpendicular to the axis of rotation of the grinding wheel and at an acute angle to the axis of rotation of the first dressing wheel to provide for engagement of the first dressing wheel with the main surface of the grinding wheel as the first dressing wheel is moved along the first path, rotating the first dressing wheel about a first axis extending generally parallel to the main surface of the grinding wheel when the first dressing wheel is in engagement with the main surface of the grinding wheel, moving the first dressing wheel away from the main surface of the grinding wheel after the main surface has been dressed, moving a second dressing wheel into engagement with the shoulder surface of the rotating grinding wheel after performing said step of moving the first dressing wheel away from the main surface of the grinding wheel, said step of moving the second dressing wheel into engagement with the shoulder surface of the grinding wheel including the step of moving the second dressing wheel along a second path extending transversely to the first path, rotating the second dressing wheel about a second axis extending generally parallel to the shoulder surface of the grinding wheel and transversely to said first axis when the second dressing wheel is in engagement with the shoulder surface of the grinding wheel, and moving the second dressing wheel away from

the shoulder surface of the grinding wheel after the shoulder surface of the grinding wheel has been dressed.

3,916,582

CUTTING-TOOL GRINDING METHOD

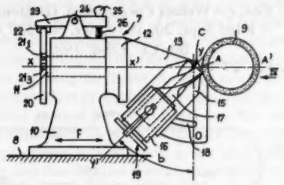
Marcel Costil, 22 Rue Vignon, Cormeilles-en-Parisis, France

Filed June 6, 1974, Ser. No. 476,999

Claims priority, application France, June 20, 1973, 73.22552

Int. Cl.² B24B *3/06, 3/18*

U.S. Cl. 51—288 **1 Claim**



1. Method of sharpening cutting tools operating by axial thrust and having at least one cutting lip to be sharpened by means of a straight-cup grinding wheel in a first cutting rake plane and a second cutting face plane, characterised in that said tool is secured in a tool holder throughout the grinding operations, said tool holder being incorporated in a jig adapted to travel longitudinally past the grinding wheel and transversely, parallel to the axis of rotation of said wheel on a sharpening-machine table, and to pivot bodily with said jig about a first axis constituting the extension of the horizontal median plane of said wheel and converging with another axis common to said tool-holder and to the tool to be sharpened, said other axis being adapted to be set by causing an angular displacement of said tool holder in a plane containing said first axis by pivoting about a pivot pin rigid with said jig and having its axis directed to the point of intersection axis, the arrangement being such that these combined pivotal movements are adapted to:

a. bring said tool to a first arbitrarily selected position in which its axis lies in a vertical plane inclined to the horizontal median plane of the grinding wheel by a negative angle equal to the rake angle of the cutting plane of said tool, the worn portion to be removed from the tool projecting beyond the centre to be formed which is coincident with said point of intersection of the first and second axes, the tool end being caused to engage the operative front face of the rotating grinding wheel for performing a first grinding operation consisting in grinding said first cutting rake plane by effecting a longitudinal movement of said jig;

b. bring said tool to a second position by subsequently pivoting said jig about said first axis through a desired angle, said pivotal movement being combined with another angular setting of the tool axis by pivoting the tool holder through a predetermined angle about its pivot pin in order to carry out a second grinding operation consisting in forming said cutting face in a second plane containing the tool centre, and

c. bring the tool to a third position by subsequently pivoting said jig about said first axis but in a direction opposite to that of said pivotal movement to said second position, the tool axis then lying in the horizontal median plane of the grinding wheel and forming a predetermined angle with the operative front face of said wheel, the tool end being caused to follow said front face of the wheel by effecting a longitudinal movement of said jig in order to cut the central portion of said tool end, during a third grinding operation, to form a small face intersecting the rake plane along a line forming with the cutting lip an angle not in excess of 90° and having its apex coincident with the tool centre, said small face limiting the central portion of the cutting lip.

3,916,583

CUT-OFF WHEELS OF FUSED ALUMINA-ZIRCONIA ALLOY ABRASIVE GRAINS

Robert A. Rowse, Shrewsbury, and Hussain G. Lakhani, Holden, both of Mass., assignors to Norton Company, Worcester, Mass.

Continuation of Ser. No. 204,373, Dec. 2, 1971, abandoned. This application May 10, 1974, Ser. No. 468,799

Int. Cl.² C09K *3/14*

U.S. Cl. 51—298 **4 Claims**

1. A cut-off wheel of abrasive grains with a grit range of 12–36 bonded by an infusible resin bond, said wheel having maximum thickness as defined below:

Wheel Diameter	Maximum Thickness
6 inches and smaller	3/16 inch
larger than 6 inches to 12 inches	1/4 inch
12 inches to 23 inches	3/8 inch
larger than 23 inches	1/2 inch;

said wheel characterized in that at least 25% by weight of the abrasive content is a fused alumina-zirconia alloy abrasive having a zirconia content between 10 and 60% by weight, an average primary alpha alumina crystal diameter less than 40 microns, and an elongated shape such that its bulk density in the 24 grit size range is in the range of from:

115 times s.g./4.35, to 135 times s.g./4.35, pounds per cubic foot, where s.g. is the specific gravity of the abrasive grit material, said wheel containing from 0–75% by weight of blocky fused alumina grit.

3,916,584

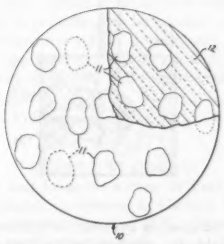
SPHEROIDAL COMPOSITE PARTICLE AND METHOD OF MAKING

Robert N. Howard, Stillwater, and Harold G. Sowman, Maplewood, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 22, 1973, Ser. No. 343,701

Int. Cl.² B24B *1/00;* **C09K** *3/14*

U.S. Cl. 51—308 **16 Claims**



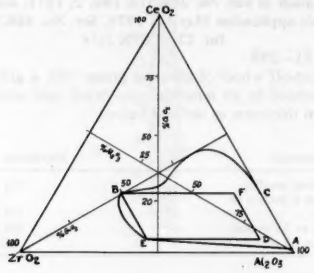
1. A spheroidal composite particle comprising about 6–65% by volume of fine abrasive grains which have a Knoop hardness of at least about 1500 and are on the order of 25 microns or less in effective diameter, said grains being distributed throughout about 94–35% by volume a microporous nonfused, nonvitrified, transparent, continuous metal oxide matrix having a Knoop hardness of less than 1,000, said matrix consisting essentially of at least one oxide selected from the class consisting of zirconia, silica, alumina, magnesia and titania, the diameter of the composite particle being 10–200 microns and at least twice that of the abrasive grains.

3,916,585

SINTERED ABRASIVE CONTAINING OXIDES FROM THE SYSTEM CERIA, ALUMINA, ZIRCONIA

Ronald E. Barks, Thompson, Conn., assignor to Norton Company, Worcester, Mass.

Filed Oct. 24, 1973, Ser. No. 409,324
Int. Cl.[2] C09K 3/14
U.S. Cl. 51—309 5 Claims



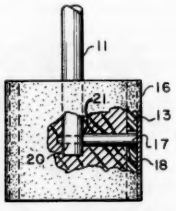
1. A grinding wheel containing bonded abrasive grits which grits are produced by sintering of formed to size particles, said grinding wheel being adapted for rough grinding application such as snag grinding of stainless steel characterized in that the individual abrasive grits have a composition including alumina, ceria, and zirconia in the compositional amounts represented within the area defined by the boundary AEBC in the accompanying ternary composition diagram, the alumina, zirconia, and ceria amounting to at least 95 weight % of the composition.

3,916,586

SANDING CYLINDER FOR DRILLS

Raul Benavides Rivas, 255 Shasta, San Antonio, Tex. 78221

Filed Nov. 8, 1974, Ser. No. 522,238
Int. Cl.[2] B24B 45/00, 23/00
U.S. Cl. 51—368 5 Claims



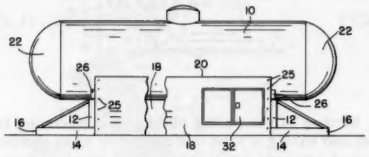
1. An improved sanding cylinder for drills comprising:
a. a shaft suitable for attaching to a rotating drive means,
b. a substantially cylindrical sanding head having a circumference secured to said shaft by,
c. a shaft cylinder securing means,
d. a sanding sleeve encircling the perimeter of said cylindrical sanding head,
e. a head groove formed in the periphery of said cylindrical sanding head extending normal from an end of said cylindrical sanding head for substantially the length of said sanding head,
f. a sleeve slot extending normal from one end of said sanding sleeve substantially the length of said sanding sleeve, said head groove and said sleeve slot being arranged substantially adjacent and parallel to each other, and
g. means for limiting the relative movement of said sanding sleeve relative to said sanding head comprising:
1. a sleeve pin projecting from the circumference of said cylindrical sanding head into,
2. a sleeve rotating slot constructed in said sanding sleeve projecting substantially normal from said sleeve slot, said structure being so arranged that said sleeve pin projects into said sleeve rotating slot limiting the relative movement of said sanding sleeve around said sanding head to a relatively small arc.

3,916,587

ENCLOSED HOUSING FOR GAS TANK STANDS

David E. Cox, c/o Weldex Corporation, Grafton, Mass. 01519

Filed Sept. 20, 1974, Ser. No. 507,663
Int. Cl.[2] E04F 19/04
U.S. Cl. 52—27 10 Claims



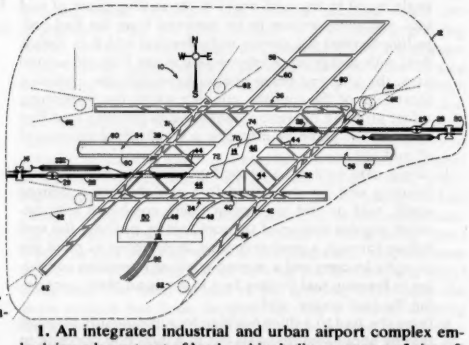
1. In combination with a gas tank and a stand therefor supporting the tank off the ground, a multi-part sheet member housing, means connecting the housing to the stand, and being held upright thereby, said housing engaging the sides and ends of the tank and completely enclosing the space between the ground and the tank, the tank forming a ceiling for the housing.

3,916,588

INTEGRATED INDUSTRIAL AND URBAN AIRPORT COMPLEX WITH PASSENGER AND FREIGHT HANDLING FACILITIES

John W. Magill, 664 N. Michigan Ave., Chicago, Ill. 60611

Filed Oct. 1, 1973, Ser. No. 396,716
Int. Cl.[2] B64F 1/00; E04H 6/00
U.S. Cl. 52—30 21 Claims



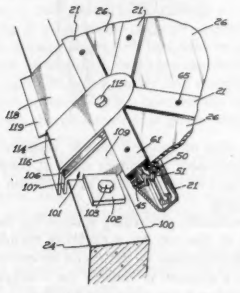
1. An integrated industrial and urban airport complex embodying a large tract of land and including a system of aircraft landing and take-off strips surrounding and defining an aircraft loading and unloading ramp area, a multi-level terminal building including a ground floor level and a second floor level located on said ramp area, and consisting of a central section having an outline which approximates that of a parallelogram, and a pair of end wing sections each of which has an outline which approximates that of a triangle, said wing sections being connected to the central section in equiangular apex-to-apex fashion so that converging sides of each wing section approximately constitute linear extensions of adjacent converging

sides of the central section, the outline of the building as a whole thus assuming a bow tie configuration, means defining a series of bi-level passenger gates along each of the four sides of the central section and each of the three sides of each wing section, each of said gates embodying ground floor level defining facilities and second floor level enplaning facilities, said aircraft landing and take-off strips and the terminal building being disposed centrally of said tract of land, said multi-story terminal building embodying, in addition to said ground floor level and said second floor level, a below grade level and additional floor levels above said second floor level, and a flat roof above the uppermost floor level, an outlying freight transfer building disposed on said tract of land remote from the terminal building for the reception of incoming freight, cargo-carrying rails for the transportation of containerized cargo extending between the freight transfer building and the terminal building and entering the latter at below grade level, endless-type cargo conveyors projecting outwardly of the terminal building from said ground floor level and into the ramp area for conducting enplaning cargo to aircraft on the ramp area, track-switching facilities on said below grade level establishing a cargo-holding and distribution area for receiving cargo from said cargo-carrying rails, cargo shuttles on said roof, ramp up-elevators extending from said below grade level to said cargo shuttles, and cargo down-elevators extending from the shuttles to the ground floor level in the vicinity of said cargo conveyors.

3,916,589
DOME CONSTRUCTION AND DRAINAGE SYSTEM THEREFOR

Donald L. Richter, Harbor City, Calif., assignor to Temcor, Torrance, Calif.

Filed Apr. 8, 1974, Ser. No. 458,589
Int. Cl.² E04B *1/32;* **E06B** *3/64*
U.S. Cl. 52—81 **5 Claims**

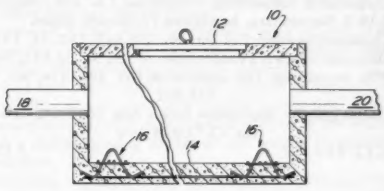


1. In a dome construction, the combination of:
a plurality of hollow tubular-section frame members defining polygonal openings,
each frame member extending along and defining one side of said opening;
a plurality of hollow gusset members interconnecting adjacent ends of said frame members at corners of said polygonal openings;
each gusset member including a bottom wall and side wall extending from said bottom wall for abutting relation with said adjacent frame member ends;
means fixedly connecting the side wall of each gusset member to said adjacent ends of said frame members;
said frame members, gusset members, and fixed connecting means providing the structural load bearing framework of said dome construction;
a plurality of panels corresponding in shape to said openings and supported at panel edge margins by said frame members; and
means provided on said frame members and gusset members for receiving and conducting moisture from surfaces of said panels to the peripheral edges of said dome construction;
said moisture conducting and receiving means being provided by the structural configuration of said frame members and said side and bottom walls of said gusset members;
said receiving and conducting means including;
channel means on each frame member below said panel edge margins;
and communicating weep and drainage holes in said frame members and in said side walls of the gusset members for drainage of condensate moisture collected by said channel means.

3,916,590
PULLING IRON

Arthur C. Miller, Concrete Products, Inc., Rte. 29, Devault, Pa. 19432

Filed Dec. 19, 1974, Ser. No. 534,508
Int. Cl.² E04H *13/00*
U.S. Cl. 52—125 **11 Claims**



1. A pulling iron adapted to be partially embedded in an underground vault comprising a loop of steel strand-type cable, said loop having legs extending from a bight portion, each leg having an extension disposed at an angle with respect thereto to facilitate connection thereof to rebars, said bight portion and at least a portion of each leg being encased in a coating of polymeric plastic material, said coating covering all portions of said loop adapted to be exposed when the loop is partially embedded in a wall of a vault, said coating being a tough plastic material which has substantially no absorption with respect to water and oil, said coating being non-rotatable with respect to said cable.

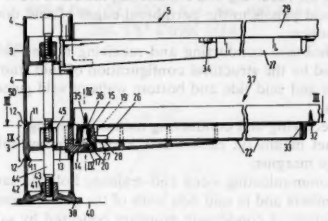
3,916,591
SPINDLE STAIRCASE

Henk Agterhof, and Johannes Antony deWaal, both of Doetinchem, Netherlands, assignors to Gieterij Doesburg B.V., Doesburg and Gebr. Agterhof N.V., Doetichem, both of, Netherlands, part interest to each

Filed Mar. 13, 1974, Ser. No. 450,810
Claims priority, application Netherlands, June 13, 1973, 7308231
Int. Cl.² E04F *11/02*
U.S. Cl. 52—187 **5 Claims**

1. A spindle staircase comprising:
a. a spindle having a plurality of spindle sections;
b. a step holder attached to at least some of said spindle sections, said step holder having an elongated, three-sided gutter and tongue-like cam;
c. a detachable step support having a bar and integral bridge piece, said bar being received in said step holder gutter and fitting with said cam;

d. means for locking said bar in said gutter; and
e. a step connected to said step support by screws hidden from view at the top side of the step;



whereby said step support with connected step is easily removable by releasing the means for locking, and said step may be conveniently replaced by mounting a new step to said step support at a convenient work area.

3,916,592

STRUCTURAL MEMBERS FOR BUILDINGS AND BUILDINGS CONSTRUCTED THEREFROM

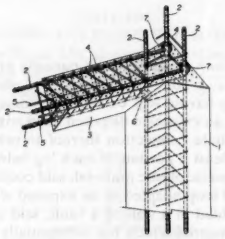
Takashi Morohashi, and Yuji Morohashi, both of Universal Corporation Engineering Consultant Co. Ltd., Sagamidai 1-15-9, Sagamihara, Kanagawa-Prefecture, Japan

Continuation-in-part of Ser. No. 298,641, Oct. 18, 1972, abandoned, which is a continuation of Ser. No. 53,137, July 8, 1970, abandoned. This application Oct. 29, 1974, Ser. No. 518,861

Claims priority, application Japan, Aug. 16, 1969, 44-64467

Int. Cl.[2] E04B *1/04*

U.S. Cl. 52—252 **6 Claims**



1. A reinforced concrete structural member adapted for buildings and the like, comprising:
a concrete column;
a plurality of extra coarse-laid wire ropes each comprising a plurality of strands each incorporating a plurality of wires laid helically in the same angular sense to provide a built-up lay, at least two strands each incorporating a plurality of wires, said at least two strands each being of at least as great diameter as the first-mentioned strands and being helically wound in two angularly opposite senses upon said built-up lay so as to cross one another at a phase angle of about 180°, the at least two strands being spaced to expose said lay exteriorly of the wire rope, between the at least two strands so the wire rope has a substantially greater diameter at the crossings of said at least two strands than where said lay is exposed exteriorly of the wire rope;
said extra coarse-laid wire ropes directly embedded in said concrete column in a three-dimensional array, in a fashion longitudinally vertically extending straight through the concrete column, but is an unstrained but unloosened stated, to reinforce the concrete column;
an open-work wrapping of steel wires or wire gauze or the like directly disposed about said array in a wrapped or wound fashion;
a concrete beam unitary with said concrete column;
a plurality of extra coarse-laid wire ropes having a structure the same as said first-mentioned extra coarse-laid wire ropes, directly embedded in said concrete beam near the upper and lower extent thereof, in a fashion longitudinally horizontally extending through the concrete beam, but under an unstrained but unloosened state, to reinforce the concrete beam;
an open-work wrapping of steel wires, or wire gauze, or the like directly disposed about said second-mentioned extra coarse-laid wire ropes;
the extra coarse-laid wire ropes of the column and beam crossing one another where the column and beam join one another; and
connecting means fastening the extra coarse-laid wire ropes of the column to the wire ropes of the beam where these wire ropes cross one another.

3,916,593

SPACER CLIP FOR JOINING AND SUPPORTING CROSSWISELY EXTENDING REINFORCING BARS

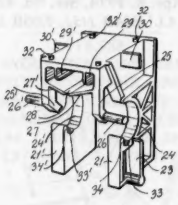
Mats Folke Skold, Backvagen 78, Hagersten, Sweden

Division of Ser. No. 229,703, Feb. 28, 1972, Pat. No. 3,789,491, which is a continuation-in-part of Ser. No. 3,765, Jan. 19, 1970, Pat. No. 3,694,988. This application Nov. 16, 1973, Ser. No. 416,502

Claims priority, application Sweden, Mar. 2, 1971, 2619/71

Int. Cl.[2] E04C *5/16*

U.S. Cl. 52—686 **10 Claims**



1. A spacer clip of molded plastic resilient material for joining two crosswisely extending bars at their intersection and supporting and retaining them in a position spaced above a base, comprising:
a. a pair of vertically extending spaced leg members interconnected at the top by a bridging member extending generally horizontally to define an inverted generally U-shaped body adapted to receive the overlying one of the bars and having a bar engaging surface;
b. an open recess having a second bar engaging surface in each of said leg members for receiving and seating the underlying one of the bars, having its axis extending transversely to the axis of the bridging member, the bottom bar engaging surface of said recesses being spaced a distance from the bar engaging surface of the bridging member which is equal to or less than the combined thicknesses of the two bars;
c. a pair of flexible members each depending downwardly from said bridging member at a spaced distance from said leg members and said second bar engaging surface and having an end portion directed inwardly in opposite relation to said second bar engaging surface to permit said members to be flexed inwardly towards said recess;
d. said flexible members being spaced apart a distance substantially equal to the spacing between the leg members and adapted to engage the underlying one of the bars and to be deflected thereby upon the insertion of the bar in the recesses and spring back and secure said under-

lying bar against said second bar engaging surface upon the seating of the bar;

e. said bar engaging surface of said bridging member comprising oppositely disposed flexible flanges extending inwardly from the leg members and located between the recesses and the bridging member.

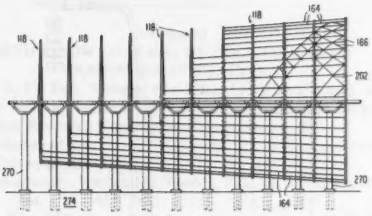
3,916,594
OFFSHORE TOWER APPARATUS AND METHOD

Albert M. Koehler, Houston, Tex., assignor to Brown & Root, Inc., Houston, Tex.

Division of Ser. Nos. 30,098, April 20, 1970, Pat. No. 3,668,876, and Ser. No. 238,167, March 27, 1972, Pat. No. 3,815,371. This application Jan. 30, 1974, Ser. No. 438,013

Int. Cl.² E04G *21/14*; **E04H** *12/00*; **E21B** *15/00*

U.S. Cl. 52—745 **4 Claims**



1. A method of constructing an offshore tower operable to be positioned upon the bed of a body of water comprising the steps of:

fabricating a plurality of offshore tower girder ring assemblies, each being fabricated by:

forming an outer substantially circular ring structure including at least one substantially circular girder beam having a central axis;

positioning a hub coaxially about said central axis; and

connecting a plurality of flexible members in tension radially between said hub and said outer circular ring structure to reinforce said ring assembly;

suspending said fabricated girder ring assemblies in a mutually parallel posture along a horizontally disposed central axis wherein the planes of said girder ring assemblies lie normal to said central axis by:

mounting said hubs upon generally vertical columns positioned between adjacent girder ring assemblies wherein the central axis of said girder ring assemblies are horizontal and generally perpendicular with respect to said vertical columns, and

rigidly interconnecting the ends of adjacent hubs;

constructing tubular offshore tower legs about the perimeter of the ring assemblies by:

connecting hollow tubular offshore tower leg segments substantially perpendicularly between the planes of adjacent girder ring assemblies so that said segments are disposed inwardly of said girder beam, and

connecting the ends of said tower leg segments with the ends of similar tower leg segments positioned between the planes of adjacent girder ring assemblies to form continuous, axially aligned, hollow tubular tower legs defining straight passages extending throughout the height of the offshore tower capable of receiving conductors projected therethrough;

reinforcing said tubular offshore tower legs by:

constructing a shell of diagonally connected cross braces, and connecting the constructed shell to said girder ring assemblies in such manner that said cross braces are located inside of said girder beam in non-intersecting relation to said tower legs so that the diagonal cross braces reinforce said tubular tower legs without intersecting said tower legs.

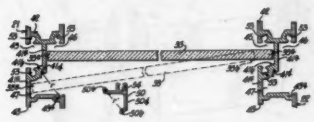
3,916,595
METHOD FOR GLASS FRAMING

Lawrence F. Biebuyck, Mesquite, Tex., assignor to Kawneer Company, Inc., Niles, Mich.

Division of Ser. No. 499,216, Aug. 21, 1974, which is a continuation of Ser. No. 401,592, Sept. 28, 1973, abandoned, which is a continuation of Ser. No. 197,705, Nov. 11, 1971, abandoned, which is a continuation-in-part of Ser. No. 59,915, July 3, 1970, abandoned. This application Dec. 13, 1974, Ser. No. 532,514

Int. Cl.² E04C *2/38*, *3/32*

U.S. Cl. 52—747 **3 Claims**



1. A method of installing a planar member in a framing assembly comprising the steps of

disposing first and second, substantially identical elongated construction elements forming at least a portion of said framing assembly in a substantially parallel, spaced-apart vertical condition defining a space for receiving said planar member therebetween,

positioning a first elongated vertical edge of said planar member in a relatively deep portion of a stepped glazing pocket of said first construction element,

moving said planar member until a second elongated vertical edge, spaced-apart and parallel to said first edge, of said planar member is positioned in front of the opening of a shallow glazing pocket of said second construction element,

positioning said second edge in said shallow glazing pocket, and

moving said first edge of said planar member laterally across said first construction element until said first edge is positioned in a relatively shallow portion of said stepped glazing pocket disposed substantially adjacent to said relatively deep portion of said stepped glazing pocket.

3,916,596
JOINT STRUCTURE

Lee E. Hawley, Janesville, Wis., assignor to Ronald Hanley; Melvin Enkkeli; Daniel M. Clark and William Bryden

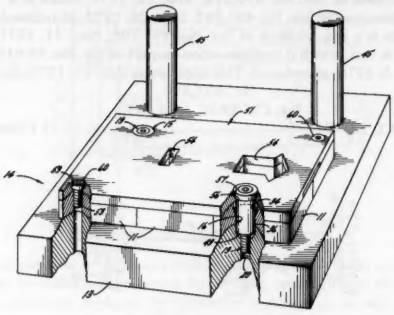
Continuation-in-part of Ser. No. 336,532, Feb. 28, 1973, abandoned. This application Dec. 2, 1974, Ser. No. 528,654

Int. Cl.² F16B *5/02*

U.S. Cl. 52—758 F **12 Claims**

1. A joint structure for precisely locating and securing an upper member on a lower member including an opening extending through said upper member and into said lower member, said opening including first and second generally cylindrical bores of the same diameter formed in said upper and lower members, respectively, said bores being axially aligned with each other when said upper member is precisely located with respect to said lower member, said opening having an upper end with a diameter at least as large as the diameter of the bores, a generally cylindrical sleeve having a fixed outside diameter substantially equal to the diameters of said bores and being telescoped into said bores with a slip fit to extend between said upper and lower members, a threaded hole opening into said second bore and extending downwardly into said lower member from the bottom of said second bore, a screw having an enlarged head and a threaded shank integrally formed with said head, said shank having a diameter substantially less than the inside diameter of said sleeve and being telescoped through said sleeve and mated with said hole regardless of whether the axis of said hole coincides with the axis

of said sleeve, and means including a lower surface integrally formed with the head of said screw and an abutting surface fixed with respect to said upper member and engaging said



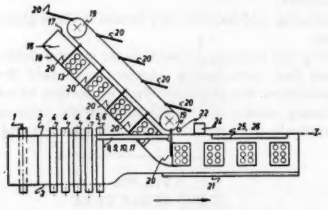
lower surface so as to support said screw vertically within said opening to tighten the upper member toward said lower member within said precisely located position with respect to said lower member.

3,916,597

PROCESS AND APPARATUS FOR PACKAGING ARTICLES

Nerio Martelli, Bologna, Italy, assignor to Solvay & Cie., Brussels, Belgium

Filed Apr. 1, 1974, Ser. No. 456,765
Claims priority, application France, Apr. 6, 1973, 73.12593
Int. Cl.² B65B *9/06, 61/00*
U.S. Cl. 53—14 **7 Claims**



1. Apparatus for packaging articles continuously comprising:

a. an endless belt for continuously moving forward a film of plastic material folded longitudinally along its median line and having first and second longitudinal edges opposite the median line;

b. gripping and spacing means for maintaining separated the edges of the film, comprising a first movable gripper for gripping the first edge of the folded film and a second movable gripper for gripping the second edge of the folded film, said first and second grippers maintaining the gripped edges of the film spaced apart from one another while moving the gripped edges at a speed substantially equal to that of the endless belt;

c. feed means for depositing the articles to be packaged onto the folded film comprising a sliding track for guiding the articles to be packaged along a trajectory tangential to the direction of advancement of said folded film and an endless chain provided with regularly spaced entrainment fingers for moving the articles forward on the sliding track until the moment when the articles are deposited by the sliding track onto a fold of the folded film supported by the endless belt;

d. two endless belts which are superposed and disposed on opposite sides of the trajectory of the folded film to place the two edges of the folded film in edge-to-edge contact and to join them together; and

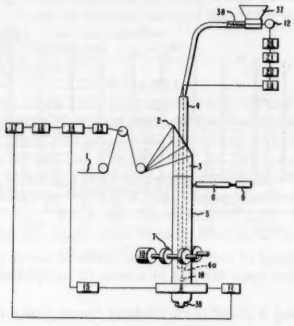
e. finishing means comprising means for transversely cutting the folded film between the articles spaced apart on the film and simultaneously transversely welding the film on both sides of the cut to form spaced rectangular bags each enclosing an article.

3,916,598

SYNCHRONIZED TUBE FORMING AND FILLING MACHINE FOR FORMING CHUB PACKAGES

Philip Edgar Adams, Martinsburg, and Frank Marsden Willis, Hedgesville, both of W. Va., assignors to E. I. Du Pont De Nemours & Company, Wilmington, Del.

Filed Oct. 15, 1974, Ser. No. 515,073
Int. Cl.² B65B *57/00, 9/12*
U.S. Cl. 53—55 **7 Claims**



1. In a packaging machine of the type which forms a web of pliable film material into a tube, feeds material to be packaged into the tube, and constricts and seals the filled tube at intervals to divide it into a plurality of individual packages, said machine including (a) tube-feeding means for advancing said tube, (b) sealing means for forming a longitudinal seam in said tube, (c) a constricting-closure unit reciprocable in the direction of axial movement of said tube for constricting the tube at spaced intervals and applying a pair of successive encircling closure means to each constricted area, and (d) a feed pump for feeding material to be packaged into said tube through a hollow mandrel, the improvement comprising

1. for cooperatively controlling elements (a), (b), (c), and (d) so that the advancement rate of the tube, the reciprocating rate of the constricting-closure unit, the rate at which material is fed into the tube, and the rate at which the seam is produced are maintained in a selected proportion as the advancement rate of the tube is changed;

2. means for independently adjusting the reciprocating rate of the constricting-closure unit; and

3. means for independently adjusting the rate at which material is fed into said tube.

3,916,599

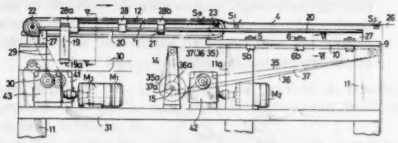
APPARATUS FOR AUTOMATIC PACKING WITH BANDS

Shinroku Mae, 14-1, Ukima 3-chome, Kita-ku, and Motosuke Umezu, 13-5, Sendagaya 3-chome, Shibuya-ku, both of Tokyo, Japan

Filed Sept. 30, 1974, Ser. No. 510,870
Int. Cl.² B65B *57/12*
U.S. Cl. 53—76 **10 Claims**

1. An apparatus for automatic binding with bands comprising band binding means, push rods for feeding objects to be bound with bands to said band binding means, a plurality of selection means for binding positions located between said band binding means and said push rods at the different intervals corresponding to band binding positions, means for re-

ducing the running velocity of each selection means corresponding to the distance from said band binding means with respect to the running velocity of said push rods, means for



stopping said selection means for binding positions when said object reaches a point just ahead of said band binding means and means for stopping said push rods at every stop position of said selection means to permit carrying out of band binding.

3,916,600

DEVICE FOR LOADING OF PACKAGES INTO TRANSPORT CONTAINERS

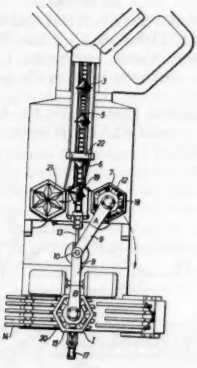
Ingvar K. O. Falt, Malmo; Per-Allan Ljungberg, Lund, and Franz Soukup, Malmo, all of Sweden, assignors to Deering Milliken Research Corporation, Spartanburg, S.C.

Continuation of Ser. No. 331,432, Feb. 12, 1973, abandoned. This application Jan. 15, 1975, Ser. No. 541,235

Claims priority, application Sweden, Feb. 14, 1972, 1707/72

Int. Cl.[2] B65B *5/08, 35/38, 35/56, 25/00*

U.S. Cl. 53—142 **2 Claims**



1. Apparatus for the loading of tetrahedron shaped packages into transport containers comprising: means to move a plurality of tetrahedron shaped packages along a conveyor track to a collection station, means mounting a first container on one side of said conveyor track, means mounting a second container on the other side of said conveyor track, said containers being adapted to support an oriented arrangement of said tetrahedron shaped packages, means to rotate each said container in a step-by-step manner in synchronization with the advance of the packages along the conveyor track, means to selectively place tetrahedron shaped packages in an oriented position in said first container or said second container, swivellable arm means to transport the oriented arrangement of tetrahedron shaped packages in one of said containers to a transport container and means to load said pre-oriented packages into said transport container.

3,916,601

MACHINE FOR PACKAGING GOODS

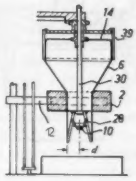
Hubert Thimon, Aix-Les-Bains, France, assignor to Societe d'Applications Thermiques, France

Filed May 17, 1974, Ser. No. 471,168

Claims priority, application France, May 17, 1973, 73.17942

Int. Cl.[2] B65B *11/00*

U.S. Cl. 53—204 **12 Claims**



1. A machine for packaging ring-shaped articles, comprising;

holding means for holding a ring-shaped article having a central hole;

means for feeding a band of flexible packaging film material from a supply of such material and for severing said band transversely from said supply;

movable primary and secondary gripping means for gripping the band along two longitudinal edges thereof and for disposing the severed band and its edges annularly around an axis to produce a tubular sheath parallel to and around said axis and to provide said sheath with open ends defined by the annularly disposed edges of the band;

a primary drive means for returnably moving the primary gripping means towards said axis to reduce the diameter of the respective open end of the sheath;

a secondary drive means for effecting relative axial displacement of the holding means in relation to the primary gripping means and for thereby displacing the primary gripping means, with the open sheath of reduced diameter held thereby, through the central hole of the article;

a tertiary drive means for effecting relative axial displacement of the secondary gripping means in relation to the primary gripping means, pursuant to return moving of the primary gripping means displaced through the central hole, to bring one of the gripping means around the article and against the other gripping means with the respective ends of the sheath held thereby; and

means for thereupon joining the two ends of the sheath together, whereby the article is packaged in said film material and the central hole is left free of such material extending across the same.

3,916,602

METHOD AND APPARATUS FOR HEAT SHRINK CAPPING CONTAINERS

William T. Doty, Baltimore, Md., assignor to Maryland Cup Corporation, Owings Mills, Md.

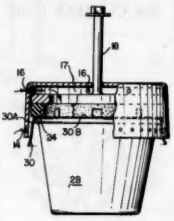
Filed Nov. 21, 1974, Ser. No. 525,876

Int. Cl.[2] B65B *53/06, 7/28*

U.S. Cl. 53—329 **5 Claims**

1. In a capping machine for applying a closure to an open top container, said machine comprising a support for the container, means for shaping and disposing a piece of heat shrinkable film on the container to conform to the top thereof in the provision of a top portion of said film extending across said open top and marginal edges of the film adjacent the portion of the wall of the container immediately below the open top, said means comprising an annular skirt adapted to surround the upper end of the container, said skirt having inlet means for the passage of air, a shank slidably mounted for

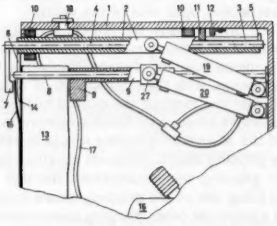
reciprocation within said skirt, a tamper plate secured to the lower end of said shank of a size to fit inside the skirt, means for forcing air through the inlet means in said skirt against said marginal edges, means for heating the air to a temperature sufficient to cause shrinkage of the film, the improvement comprising: flow passage means in said tamper plate in communication with said inlet means in said skirt to permit the flow of heated air across the top portion of said container simultaneously with the application of said heated air to said marginal edges, whereby said heated air causes both said top portion and marginal edges of said film to simultaneously shrink and form a tight seal between said film and said open top.



3,916,603
APPARATUS FOR OPENING AND SECURING OF CARRIER BAGS

Asbjörn Helge Kristiansen, Vagtsgt. 56, Oslo 4, Norway

Filed Nov. 26, 1974, Ser. No. 527,300
Int. Cl.² B65B *43/28*
U.S. Cl. 53—384 **7 Claims**



1. An apparatus for opening of carrier bags and securing thereof in opened condition, comprising a magazine with a carrier means for suspension of bags by means of throughgoing holes in the bags, means for feeding of bags in the magazine, means for gripping and carrying along of the front wall of the foremost bag, and a holding means for retaining the rear wall of the bag, wherein the gripping means comprise at least one pair of cooperating, relatively movable gripping members adapted to operate in synchronism with the holding means for the rear wall of the bag, means being provided for exertion of periodical pressure on the holding means, for release of the holding means simultaneously with termination of the gripping action of the gripping members.

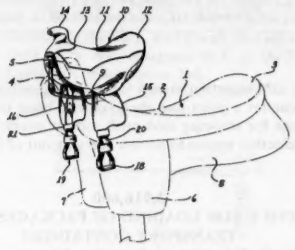
3,916,604
EQUESTRIAN TRAINING SADDLE

Ulysses S. Phipps, Box 653, Miller Star Rte., Tucson, Ariz.

Filed Nov. 20, 1974, Ser. No. 525,380
Int. Cl.² B68C *1/00*
U.S. Cl. 54—44 **9 Claims**

1. An equestrian training apparatus for small children, said apparatus comprising in combination:

a. a full sized saddle having at least a pommel and a tuttle;
b. a training saddle having a seat, cantle, pommel and stirrups, of proportions commensurate with a small child and mounted upon a base, said training saddle including a downwardly opening depression disposed within said base for receivingly mating with the pommel of said full sized saddle to position said training saddle upon the pommel of said full sized saddle and to establish positional orientation therebetween; and

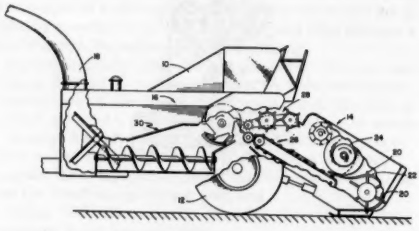


c. strap means interconnecting said training saddle and said full sized saddle to prevent independent movement therebetween; whereby, said training saddle is mounted forward of the seat of said full sized saddle such that both said training saddle and said full sized saddle may be occupied simultaneously to afford the opportunity to provide a child with continuous verbal and physical instruction in horsemanship.

3,916,605
FORAGE HARVESTER WITH IMPROVED FLOW PATTERN FOR CUT MATERIAL

Gerald F. Richards, Celina, and Nathan L. Blake, Coldwater, both of Ohio, assignors to Avco Corporation, Coldwater, Ohio

Filed Feb. 5, 1974, Ser. No. 440,155
Int. Cl.² A01D *49/00*
U.S. Cl. 56—13.3 **6 Claims**



1. Apparatus for cutting and discharging material for ensilage, said apparatus comprising:
a housing having a central plane and an opening at its forward end for receiving harvested material and an opening adjacent its aft end for discharging cut material;
a fixed laterally extending shear bar positioned across the forward opening of said housing;
a rotary cutter having helical cutter blades formed with leading edges and journaled for rotation about an axis transverse to the housing and parallel to said fixed shear bar for cutting and passing rearwardly material passing into and through the forward end of said housing and between the cutter and bar; and
an auger journaled for rotation about a fore and aft axis, offset from said central plane, for receiving cut material

and passing it toward the aft opening of said housing for discharge;

said helical cutter blades being formed to force material in the direction of the offset and said auger being so formed and rotated that the cut material passing from the cutter blades is thrown toward the feed side of said auger.

3,916,606

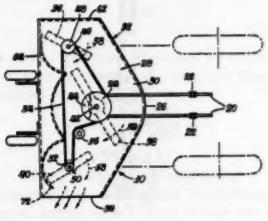
ROTARY MOWER

Andrew Brudnak, Jr., Oak Lawn, and Jerrold A. Isaacson, Lombard, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Continuation of Ser. No. 768,672, Oct. 18, 1968, abandoned. This application Nov. 4, 1970, Ser. No. 86,933

Int. Cl. A01d *55/18*

U.S. Cl. 56—13.4 **6 Claims**



1. A mower adapted to be moved along the ground comprising a hood having an open bottom and a depending side wall surrounding the area covered by the hood except a lateral discharge opening and providing a reference side remote from said opening, cutter means in the hood comprising at least three impact cutters spaced linearly of a generally transverse path extending downstream from said reference side to the discharge opening, each cutter of said cutter means being adapted to cut plants thereahead within a portion of said path respectively registering therewith and to advance the plants cut thereby downstream into the path portion registering with the cutter disposed next adjacently thereto downstream of said path and for ultimate discharge of the cut plants through said opening, and means for operating the cutters at progressively increased effective speeds from said reference side toward said discharge opening for accelerating the movement of the cut plants from successive cutters and toward said discharge opening by impacting at increasing speeds against the successively transferred plants.

3,916,607

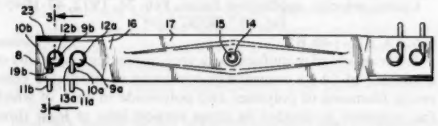
ROTARY BLADE RAKE

Orvel Howard, P.O. Box 222, 401 W. 12th St., Rock Falls, Ill. 61071

Filed Apr. 18, 1974, Ser. No. 462,048

Int. Cl.² A01D *35/26*

U.S. Cl. 56—17.5 **9 Claims**



1. A rotary lawn mower rake device comprising in combination: a rotary blade having an integral fixed end portion at each of opposite ends thereof, each end portion having upper and lower substantially flat faces, and spaced about equidistantly between the opposite ends, there being mounting means for mounting the blade on a rotary shaft means for rotation of the rotary blade as a part of a rotary mower, there being at least one pair of apertures spaced-apart from one-another a predetermined distance, each aperture extending between the upper and lower faces for each end portion; for each pair, a tine shaped in a predetermined tine-shape having an upper end portion bent in a direction angularly transversely to a longitudinal axially extending axis of a lower end portion of the tine, and the upper end portion having its terminal end bent in a substantially circular hook-shape defining a through-space with the circularly hook-shaped terminal end extending in a plane substantially parallel to that of the upper portion and substantially transverse to the angularly downwardly extending lower portion; for each pair of apertures, said tine being of a cross-sectional area snuggly inserted angularly downwardly through a first one of the apertures and having the through-space aligned with the remaining second aperture; and bolt means having a threaded shaft inserted through said through-space and mated and secured in said aligned second aperture anchoring said tine on said upper face, the lower end portion of the tine extending through the second aperture and downwardly from said lower substantially flat face.

3,916,608

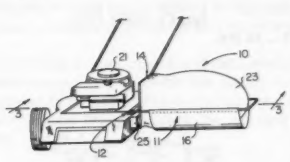
METHOD OF AND APPARATUS FOR COLLECTING GRASS CUTTINGS

Leon E. Garrison, 1309 Belaire Drive, Richardson, Tex. 75080

Filed Mar. 28, 1974, Ser. No. 455,598

Int. Cl.² A01D *35/24*

U.S. Cl. 56—202 **1 Claim**



1. A grass catching apparatus for a rotary lawn mower of the type having a port for discharge of an airstream carrying cut grass and the like to facilitate the collection of the cut grass directly in an air impervious disposable bag and providing means for the attachment and detachment of the disposable bag out of line of the discharge airstream of the lawn mower, which comprises:

a carriage frame of generally rectangular shape for horizontally supporting and providing a means for longitudinal alignment of the disposable bag in parallel relationship to the discharge airstream;

frame means mounted to said carriage frame and extending uprightly in respect thereto; said frame means positioned at one end of said carriage frame and having a generally rectangular shape, the narrow portion of which being substantially equivalent to the width of said carriage frame and mounted to intersect therewith so that said frame means extends partially downwardly from and substantially upwardly from said carriage frame;

said frame means further having an external groove formed around its periphery for receiving the mouth of the bag therearound and covering said groove;

elastic retaining means circumscribing said frame means groove for retaining a peripheral portion of the mouth of the bag within said groove;

said frame means being pivotally mounted on said carriage frame for rotation about a substantially horizontal axis across said carriage frame, perpendicular to the longitudinal dimension thereof, for providing means for positioning the lower portion of said frame means and bag mouth therearound into and out of registry with said mower discharge port by the pivoting of said frame means and disposable bag mouth;

a span of flexible material suspended laterally across said carriage frame forming a generally U-shaped cradle extending downwardly from said carriage frame and forming a peripheral end shape adjacent said frame means, substantially equivalent to, and contiguous with, the portion thereof downwardly extending from said carriage frame; and

means for releasably attaching said carriage frame to the mower for being cantiliverly supported therefrom, with the lower most portion of said frame means and mouth of the disposable bag therearound aligned to intersect the discharge airstream adjacent to the discharge port;

said flexible cradle positioned on said carriage frame for conforming underlying support of the disposable bag for allowing it to inflate while defining a conforming path of ingress for the mower airstream along the lower conformingly supported wall of the bag providing a smooth ingress flow path in a direction opposite to a path of egress for the airstream along the opposite freely inflated bag wall producing an impingement of the cuttings of the cut grass against the bottom wall of the bag, substantially depositing the cut grass therein.

3,916,609
DRAW-TEXTURING APPARATUS

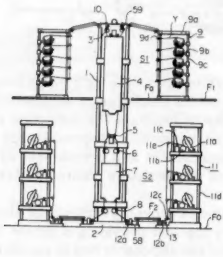
Seibi Yamada, Yokohama, and Kinyu Ishida, Takatsuki, both of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Oct. 9, 1973, Ser. No. 404,643

Claims priority, application Japan, Oct. 11, 1972, 47-116795

Int. Cl. D02g *1/02*

U.S. Cl. 57—34 HS **15 Claims**



1. A draw-texturing apparatus for synthetic fibers of the type comprising a supply roller supplying an undrawn yarn, a draw-false-twisting body proper which comprises a first heater, a false-twisting means for imparting twist to the yarn, a first delivery roller rotating at a peripheral speed greater than that of the supply roller and drawing and supplying the yarn, a second heater and a second delivery roller advancing the yarn to a take-up means, the improvement comprising an intermediate floor, said body proper being arranged through and beyond said intermediate floor, package supply means located on said intermediate floor in opposing relation in the upper portion of said body proper, a first operational floor formed between said package supply means and the upper portion of said body proper, an apparatus base floor, take-up means placed on the apparatus base floor in opposing relation in the lower portion of said body proper and a second operational floor provided with yarn passages underneath formed between the lower portion of said body proper and said take-up means.

3,916,610
ROVING FRAME BOLSTER

John P. Kieronski, Charlotte, N.C., and Charles W. Long, Rock Hill, S.C., assignors to Whitin Machine Works, Inc., Charlotte, N.C.

Filed June 26, 1974, Ser. No. 483,400

Int. Cl.² D01H *7/12, 7/24*

U.S. Cl. 57—71 **12 Claims**

1. In a roving frame, a spindle assembly for twisting a strand of fibers and winding the strand on a bobbin, said spindle assembly including a rotatable spindle shaft and a flyer affixed to the shaft, a bolster tube, a bobbin rotatably supported on the exterior of the bolster tube, drive means including means for driving the spindle at a desired speed and means for rotating the bobbin, said spindle shaft being rotatably supported in the interior of the bolster tube, means resiliently supporting the bolster tube on an element of the roving frame for lateral pivotal movement relative to the frame element, said resilient supporting means including a rigid annular surface fixed relative to the frame element, a rigid peripheral surface on the bolster tube adjacent a lower end thereof, said peripheral surface being in abutting contact with said annular surface and being axially supported thereby, and spring means to axially resiliently bias said peripheral surface into engagement with said annular surface whereby lateral pivotal movement of said bolster tube resulting in relative movement between said peripheral surface and said annular surface is resisted by said spring means.

3,916,611
MIXED FILAMENT YARN

Masao Matsui, Takatsuki; Susumu Tokura, Osaka, and Masahiro Yamabe, Neyagawa, all of Japan, assignors to Kanebo, Ltd., Tokyo, Japan

Division of Ser. No. 332,068, Feb. 13, 1973, Pat. No. 3,853,977. This application June 10, 1974, Ser. No. 478,064

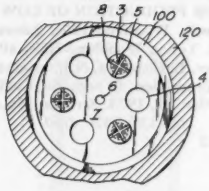
Claims priority, application Japan, Feb. 24, 1972, 47-19451

Int. Cl.² D02G *3/04*

U.S. Cl. 57—140 BY **5 Claims**

1. An article of manufacture, a yarn consisting essentially of a mixture of (A) a component consisting of fibrillated composite filaments of polyester and polyamide in each of which the polyester is divided in cross section into at least three segments by thin cross sectional layers of polyamide having a uniform thickness and which in cross section diverge radially and (B) a component consisting of polyester monofilaments; said components (A) and (B) being mixed homogeneously and entangled with each other, the ratio of component (A) to total yarn being 40 to 70% by weight, the ratio of polyamide to the total yarn being less than 30% by weight, the ratio of

polyamide to component (A) being less than 40% by weight, each polyester segment of component (A) being less than 1 denier and said polyester filaments of component (B) being more than 2 deniers,

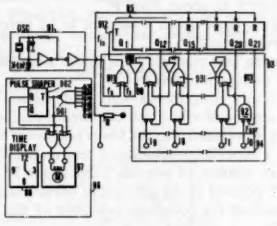


said component (A) being fibrillated by drawing and false twisting a yarn consisting of composite filaments of (A) and filaments of component (B).

3,916,612
ELECTRONIC TIMEPIECE

Shigeru Morokawa, Tokorozawa, and Yukio Hashimoto, Niiza, both of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Sept. 26, 1973, Ser. No. 401,118
Claims priority, application Japan, Oct. 2, 1972, 47-098766; May 21, 1973, 48-056444
Int. Cl.² G04C *3/00;* **G04B** *27/00*
U.S. Cl. 58—23 R **7 Claims**



1. An electronic timepiece comprising:

a source of electrical pulses having a constant elevated frequency;

a multistage binary frequency divider for producing lower-frequency pulse trains at a plurality of stage outputs thereof;

pulse-responsive means connected to at least one of said stage outputs for stepping by the pulse train thereof;

an anticoincidence gate inserted between said source and said frequency divider having a first and a second input, said first input being connected to said source;

time-indicating means connected to said pulse-responsive means;

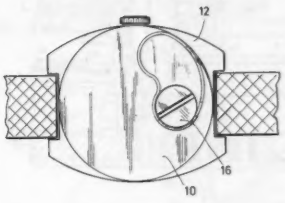
feedback means having branches coupling said second input to certain of said stage outputs for logically combining said lower-frequency pulse trains thereof with said electrical pulses; and

circuit-breaking means in said feedback means for optionally open-circuiting and short-circuiting selected branches of said feedback means to vary the stepping rate of said pulse-responsive means.

3,916,613
CONTACTING, LOCATING AND EXCHANGING MEANS FOR ENERGY CELLS IN TIMEPIECES

Fred Esselborn, Pforzheim, Germany, assignor to Timex Corporation, Waterbury, Conn.

Filed Mar. 12, 1975, Ser. No. 554,300
Claims priority, application Germany, Apr. 27, 1974, 2425622
Int. Cl.² G04C *3/00;* **G04B** *37/00;* **G06F** *7/38;* **G03B** *17/02*
U.S. Cl. 58—23 BA **10 Claims**



1. In a battery-driven small electric device, especially an electric wristwatch, of the type having a case with a wall, the improvement comprising:

a space defined within said case adpated to receive a plurality of batteries,

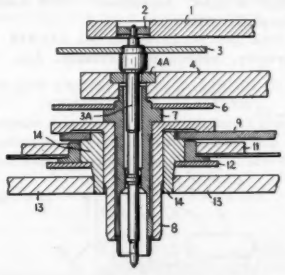
an opening above said space defined in the case wall proportioned to receive only one of said batteries at a time, and

means for moving at least one of said batteries from a position within said space in which this battery is not below said opening to a position below said opening, so that the batteries can be brought below the opening one after another.

3,916,614
TIMEPIECE PROVIDED WITH A GUIDE BUSH

Tatsuo Takatsuki, Matsudo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Dec. 10, 1974, Ser. No. 531,386
Claims priority, application Japan, Dec. 10, 1973, 48-140711
Int. Cl.² G04B *33/00, 13/02*
U.S. Cl. 58—59 **2 Claims**



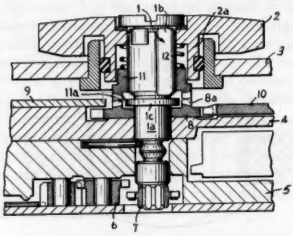
1. In a timepiece provided with a guide bush disposed between an hour wheel guard plate and a dial plate: a second arbor provided with a fourth wheel, a cannon pinion and an hour wheel respectively and rotatably mounted into the guide bush, said guide bush being fixedly mounted to the hour wheel guard plate such that said arbor, pinion and wheels are rotatably mounted into said guide bush and to said dial plate via said guide bush.

3,916,615

WINDING MECHANISM FOR BACK WINDING WATCH

Katsutoshi Maeda, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Aug. 27, 1974, Ser. No. 500,860
Claims priority, application Japan, Aug. 28, 1973, 48-96462
Int. Cl.[2] G04B 27/04
U.S. Cl. 58—68 5 Claims



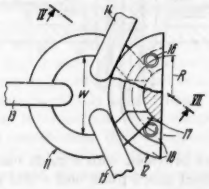
1. A winding mechanism comprising a winding stem mounted for rotation for winding a watch-winding mechanism in a winding first position and movable axially to a hand-setting second position for rotation for setting hand-setting mechanism, a winding crown mounting said winding stem for rotation and axial movement, a winding gear mounted for rotation about said winding stem and having peripheral teeth and ratchet teeth, a ratchet gear meshing with the peripheral teeth of said winding gear, a clutch gear mounted coaxially with said winding gear and axially slidable on said winding stem for rotation therewith, spring means housed in a space defined between said winding stem and said winding crown and constantly resiliently biasing the clutch gear axially on said winding stem in a direction for meshing with said ratchet teeth of the winding gear and allowing said clutch gear to be displaced axially away from said winding gear when said crown is rotated in a direction opposite to a winding direction for winding said winding mechanism, and means on said winding stem to displace said clutch gear axially away from said winding gear against a biasing force of said spring means when said winding stem is moved axially from said first winding position to said hand-setting second position.

3,916,616

CHAIN LOCK

Erhard Alfred Weidler, Jahnstrasse, 7084 Unterkochen, Wurttemberg, Germany

Filed Jan. 14, 1974, Ser. No. 432,810
Claims priority, application Germany, Jan. 16, 1973, 2302457
Int. Cl.[2] F16G 15/04
U.S. Cl. 59—85 10 Claims



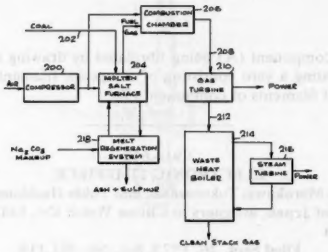
1. A chain lock for chain links comprising a bow-like basic element having the ends spaced to define an entry slot, tapered flange-like projections on said ends, a locking element having an arcuate generally T-shaped groove therein for bridging said entry slot and receiving said projections, and at least one arresting element extending across said groove and engaging with at least one of said projections whereby said basic element is locked to the chain links.

3,916,617

PROCESS FOR PRODUCTION OF LOW BTU GAS

Donald E. McKenzie, Woodland Hills; James R. Birk, San Jose; Samuel J. Yosim, Woodland Hills, all of Calif., and Donald A. Huber, Englishtown, N.J., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 29, 1974, Ser. No. 456,425
Int. Cl.[2] F02C 3/00
U.S. Cl. 60—39.02 4 Claims



1. A continuous process for gasifying coal which comprises:
a. providing in a reaction zone a molten salt consisting essentially of a major portion of sodium carbonate and a minor portion of from about 1 to about 25 wt. percent sodium sulfide;
b. maintaining said molten salt at a temperature of from about 1600°F to about 2000°F;
c. maintaining from about 1 percent to 10 percent carbon in said molten salt;
d. maintaining said reaction zone under a pressure of from about 1 to 20 atmospheres;
e. concurrently introducing into said carbon-containing molten salt a sulfur and ash-containing coal and air, the air being introduced into the lower portion of the reaction zone at a superficial velocity of less than about 3 ft/sec and in an amount to provide from about 35 percent to about 45 percent of the amount of oxygen stoichiometrically required for complete oxidation of the introduced coal, and
f. controlling the conditions set forth in paragraphs (a)-(e) to promote carbon monoxide production and thermally decompose the coal to produce a substantially sulfur and ash-free combustible, low BTU gaseous effluent containing a volume ratio of carbon monoxide to carbon dioxide of at least 5:1 and having a heating value within a range of from about 100–200 BTU/scf, the sulfur and ash content of the coal being retained in the molten salt.

3,916,618

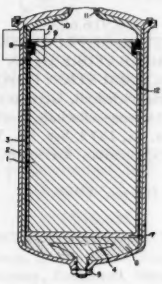
HOLDING DEVICE FOR HOLDING A PROPELLANT GRAIN IN A COMBUSTION CHAMBER

Ikuo Araki; Michinori Takizuka, and Teruo Kanazawa, all of Aichi, Japan, assignors to Nihon Yushi Co., Ltd., Tokyo, Japan

Filed Oct. 7, 1974, Ser. No. 512,715
Claims priority, application Japan, Oct. 17, 1973, 48-115838
Int. Cl.[2] F02K 9/04
U.S. Cl. 60—39.47 5 Claims

1. A holding device for holding a solid propellant in a combustion chamber, comprising a holder fixed to the front end of said combustion chamber, a supporter-buffer mounted in

the front end portion of said combustion chamber, said holder being embedded in said supporter-buffer, a restrictor coated on said propellant grain and bonded to said supporter-buffer, an isulator surrounding said restrictor-coated propellant grain with a clearance therebetween, a tapered portion provided at the rear end of said propellant grain having the same inclination as that of the locus along which said propellant grain is



moved due to the thermal expansion and contraction thereof, a rear annular ring fixed to said insulator and provided with a tapered surface having the same inclination as that of said tapered portion, and the surface of said tapered portion at the rear end of said propellant grain being adapted to come into contact with said tapered surface of said insulator within the working temperature range.

3,916,619

BURNING METHOD FOR GAS TURBINE COMBUSTOR AND A CONSTRUCTION THEREOF

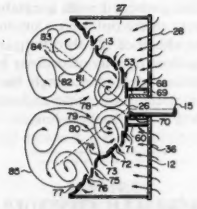
Tadahisa Masai, and Isao Sato, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 26, 1973, Ser. No. 410,105

Claims priority, application Japan, Oct. 30, 1972, 47-107993; Oct. 30, 1972, 47-107997

Int. Cl.² F02C *7/22*

U.S. Cl. 60—39.65 **8 Claims**



1. A gas turbine combustor comprising

a cylindrical liner wall;

a conical liner cap located at one end of said cylindrical liner wall, whereby said cylindrical liner wall and said liner cap form a combustion chamber for the gas turbine; a fuel nozzle provided at said liner cap for spraying fuel in a conical manner into the combustion chamber;

first air supply ports annularly arranged on said liner cap in the vicinity of said fuel nozzle in such manner that air flows along said liner cap toward said fuel nozzle;

second air supply ports annularly arranged on said liner cap downstream of said first air supply ports with respect to the stream of fuel sprayed from said fuel nozzle in such manner that a turning air flow about the axis of the combustion chamber results and together with the air flow from said first air supply ports forms a first annular vortex stream along said liner cap in the vicinity of the fuel nozzle; and

third air supply ports annularly arranged on said liner cap downstream of said second air supply ports in such manner that air flows toward the downstream side of the first annular vortex stream.

3,916,620

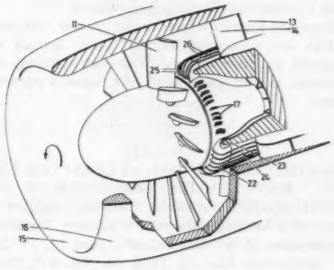
PROPULSIVE DUCTED FANS

Gilroy Reginald Ketley, Hatfield, England, assignor to Hawker Siddeley Dynamics Limited, England

Filed May 16, 1974, Ser. No. 470,466

Int. Cl.² F02C *3/06;* **F02K** *3/06*

U.S. Cl. 60—226 A **3 Claims**



1. A gas turbine power plant; comprising a ducted fan having a rotor with reversible pitch blades, a core engine mounted centrally in the fan duct and coupled to drive the fan, an air intake for the core engine situated in the fan duct downstream of the fan rotor said air intake having an intake lip at its upstream end facing the fan rotor, an annular bypass passage surrounding said core engine and air intake, a fan stator located downstream of the core engine intake in said annular bypass passage which fan stator has stator blades angled oppositely to the blades of the fan rotor in forward pitch setting and curved from a leading edge at an angle tangential to the flow direction of the swirling air leaving the fan rotor to an axially directed trailing edge, inlet guide vanes provided in said core engine intake, and flow-correcting blades projecting out from the core engine intake lip which are angled such as to substantially reverse the swirl given by the fan stator to the portion of the initially forward-flowing air that enters the engine intake when the fan rotor is in reverse pitch, while presenting substantially zero incidence angle to the rearward air flow from the fan rotor when the fan is in forward pitch.

3,916,621

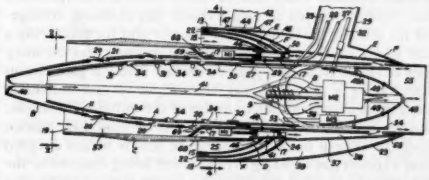
PULSE-JET ENGINE WITH VARIABLE VOLUME COMBUSTION CHAMBER

Cosmo Carleton Amenta, P.O. Box 650, North East, Pa. 16428

Continuation-in-part of Ser. No. 281,640, Aug. 18, 1972, abandoned. This application Aug. 26, 1974, Ser. No. 500,445

Int. Cl.² F02K *7/06*

U.S. Cl. 60—244 **6 Claims**



1. A jet propulsion unit comprising,

a generally cylindrical outer burner wall being tapered inward toward the inlet end and generally conical in shape,

an inner combustion shell disposed in said outer burner wall and being of a similar shape and disposed inside said outer burner wall and defining an annular chamber therebetween,

spaced air intake scoops in the outer periphery of said outer burner wall,

means to supply fuel to said annular space,

and spark means adjacent the inlet end of said annular chamber, electrical means for applying a high tension current to said spark means whereby said fuel is ignited, and means to move said inner burner wall selectively toward and away from said inlet whereby the inlet to said combustion chamber and the size of the space making up said combustion chamber is regulated,

openings are formed in said outer burner wall and flutter valves are supported on said outer burner wall and adapted to intermittently close said openings when the pressure in said space decreases below a predetermined value.

3,916,622

COMBUSTION ENGINE WITH AT LEAST ONE EXHAUST GAS CLEANING ARRANGEMENT

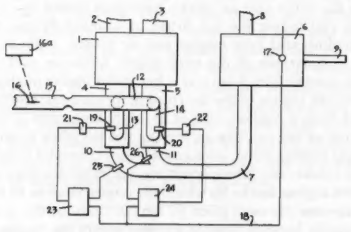
Reinhard Gospodar, Wolfsburg, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Continuation of Ser. No. 262,007, June 12, 1972. This application May 31, 1974, Ser. No. 475,296

Claims priority, application Germany, Sept. 4, 1971, 2144395

Int. Cl. F02b *75/10*

U.S. Cl. 60—277 **29 Claims**



1. A combustion engine comprising a plurality of combustion spaces or cylinders, fuel and combustion air supplying means, exhaust conduits for the individual combustion spaces for delivering the exhaust gas from said combustion spaces, an exhaust gas cleaning arrangement connected in a common branch of said individual exhaust gas conduits, sensing means coupled to said combustion spaces for sensing characteristic conditions of the individual cylinders, means reponsive to an individual sensed condition when the individual condition of a cylinder deviates from a predetermined magnitude and developing a signal when such deviation occurs, means responsive to said signal for regulating the fuel flow to said individual cylinder when said deviation occurs, a temperature sensor means coupled to said exhaust gas cleaning arrangement for sensing the temperature thereof and for producing a signal when said temperature of said exhaust gas cleaning means deviates from said predetermined value, a gate circuit means having a pair of inputs, the output of said individual sensing means sensing the condition of the individual cylinder being connected to one of said inputs of said gate circuit means, the output of said temperature sensor means coupled to said exhaust gas cleaning arrangement being coupled to the other one of said input of said gating circuit means, said gating circuit means passing the output signal of said temperature sensor means of said exhaust cleaning arrangement when an output signal is present at said first output thereof, said fuel supply means comprising operating means, the output of said gating circuit means being coupled to said operating means for energizing said operating means for effecting regulation of said fuel supply to said individual cylinder when the conditions thereof deviate from a predetermined magnitude.

3,916,623

DEVICE FOR CONTROL OF PROCESSES THAT DEPEND ON ENGINE TEMPERATURE IN AN AUTOMOTIVE INTERNAL COMBUSTION POWERPLANT

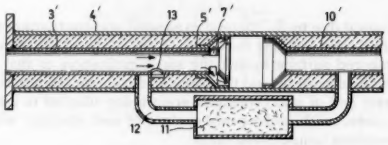
Horst Heide, Bad Friedrichshall, Germany, assignor to Audi NSU Auto Union Aktiengesellschaft, Neckarsulm, Germany

Filed Sept. 11, 1973, Ser. No. 396,234

Claims priority, application Germany, Sept. 19, 1972, 2245885

Int. Cl.² F01N *3/14*

U.S. Cl. 60—288 **1 Claim**



1. An exhaust system for an automotive internal combustion powerplant comprising; an inner pipe and an outer pipe longitudinally displaceable relative to each other, which pipes are parts of a thermal reactor and are thrust one into the other upon heating, a control means having two parts, one part being a segment of the inner pipe and the other part being attached to the outer pipe, the control means defining a throttling zone for the exhaust gases passing through the inner pipe, the cross-section of the throttling zone enlarging with rising temperature and consequent relative displacement of the pipes, a by-pass line provided with a catalytic afterburning means and connected to the outer pipe and in communication with the inner pipe ahead of the throttling zone in the direction of exhaust gas flow by way of orifices in the wall of the inner pipe, said orifices being increasingly throttled down with rising temperature of the inner pipe and consequent movement thereof relative to the by-pass line.

3,916,624

HYDRAULIC CONTROLS

Karl-Heinz Machens, Hannover; Erich Reupke, Wennigsen, and Gerhard Isensee, Hannover, all of Germany, assignors to Massey-Ferguson Services N.V., Curacao, Netherlands

Filed Nov. 13, 1974, Ser. No. 523,378

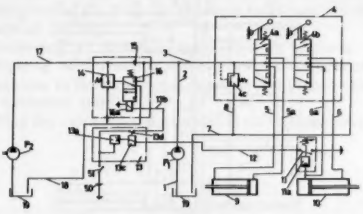
Claims priority, application Germany, Nov. 14, 1973, 2356809

Int. Cl.² F15B *11/16*

U.S. Cl. 60—394 **8 Claims**

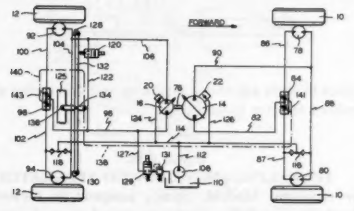
1. A hydraulic control system comprising a reservoir for hydraulic fluid, a main pump, a fluid pressure actuator and a control valve for control of pressure fluid therebetween, an auxiliary pump and an auxiliary valve means adapted to channel pressure fluid from said auxiliary pump alternatively into said circuit or to the reservoir, control means for conditioning said auxiliary valve means including a conduit for sensing the pressure of said actuator in response to a pressure level of predetermined value in said actuator wherein said control

means incorporates a time delay device which is operative in response to the pressure in said conduit to delay the change



in condition of said auxiliary valve means when the pressure level reaches said predetermined value.

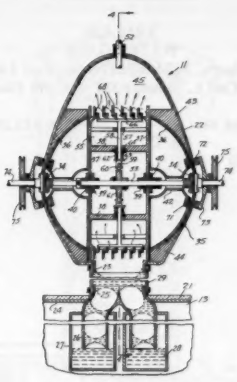
3,916,625
HYDROSTATIC PROPULSION SYSTEM
Donald A. Holtkamp, Battle Creek, Mich., assignor to Clark Equipment Company, Buchanan, Mich.
Filed Sept. 23, 1974, Ser. No. 508,587
Int. Cl.[2] F16H *39/46*
U.S. Cl. 60—421 **13 Claims**



1. In a hydrostatic drive system for a vehicle having first and second traction means, first and second hydraulic motor means for driving respective ones of said traction means and a prime mover means, first and second variable displacement hydraulic pump means driven by the prime mover means for driving the first and second motor means, respectively, said first pump means having a fluid discharge capability greater than said second pump means, and means controlling the fluid discharge of said first and second pump means including magnetic link means and means limiting the fluid discharge of said first pump means substantially to the fluid discharge of said second pump means in a first vehicle operating condition.

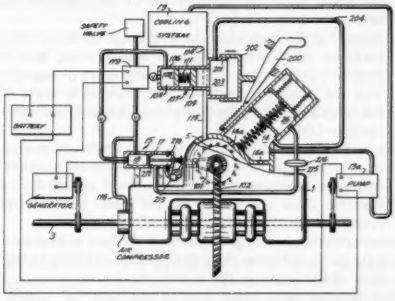
3,916,626
THERMALLY POWERED GENERATING SYSTEM EMPLOYING A HEAT VAPOR BUBBLE ENGINE
George O. Schur, 3775 SW. 108th Ave., Miami, Fla. 33165
Filed May 31, 1974, Ser. No. 474,915
Int. Cl. F03b *1/02;* **F03g** *7/00*
U.S. Cl. 60—496 **22 Claims**

1. A heat engine comprising a hermetically sealed container, a quantity of liquid having a relatively low boiling point in said container, a rotor assembly mounted in said container and having a plurality of radially extending chambers, pivoted flap valve means at the outer ends of said chambers, means biasing said flap valve means to closed positions, means opening said flap valve means respectively at the lowermost and uppermost positions of their associated chambers, heat exchange means beneath the container, bubble-generating cell means in said heat exchange means, conduit means communicatively connecting said cell means to the lower end of said container, means to expose said heat exchange means to a heated medium, whereby to generate vapor bubbles of said liquid in said cell means which pass upwardly through said conduit means and into said chambers and drive said rotor



assembly, vapor-condensing means at the top of said container, external driven shaft means, and means coupling said rotor assembly to said external driven shaft means.

3,916,627
APPARATUS FOR DELIVERING POWER
Wilmer Keyes, 557 Wyona St., Brookyln, N.Y. 11207
Continuation-in-part of Ser. No. 293,165, Sept. 28, 1972, Pat. No. 3,815,366, which is a continuation-in-part of Ser. No. 29,426, Nov. 24, 1970, abandoned, which is a continuation-in-part of Ser. No. 802,331, Feb. 24, 1969, abandoned. This application Nov. 19, 1973, Ser. No. 416,986
Int. Cl.[2] F01K *27/00*
U.S. Cl. 60—721 **6 Claims**



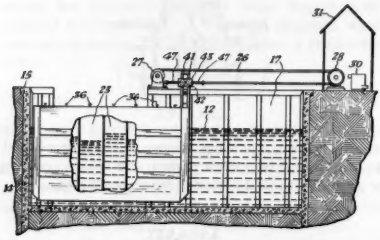
1. Apparatus for delivering power comprising a closed hydraulic circuit in which a liquid is adapted to circulate under pressure, a closed fluid conduit through which a gaseous fluid is adapted to circulate under pressure, a cylinder with a reciprocally movable piston in said fluid circuit, an output means, means for driving said output means at least in part by the circulating liquid in said hydraulic circuit, means common to both said circuits for delivering power from the fluid circuit to the hydraulic curcuit to produce circulation of said liquid, reaction means in said hydraulic circuit comprising a rotatable blade wheel in said hydraulic circuit coupled to the piston in the fluid circuit, means drivingly coupling said blade wheel to said output means, input means for supplying external power to said piston in the fluid circuit to drive said piston in reciprocation and to circulate the fluid in the fluid circuit and modulation means operatively associated with said second

piston for controlling the reciprocating of the first piston in said fluid circuit.

3,916,628
WATER GATE

Richard L. Halpern, 3024 NE. 21st St., Fort Lauderdale, Fla. 33305, and Carl L. Skiles, 6321 SW. 5th Place, Plantation, Fla. 33317

Filed Nov. 11, 1974, Ser. No. 522,582
Int. Cl.² E02B 7/50
U.S. Cl. 61—28 **1 Claim**



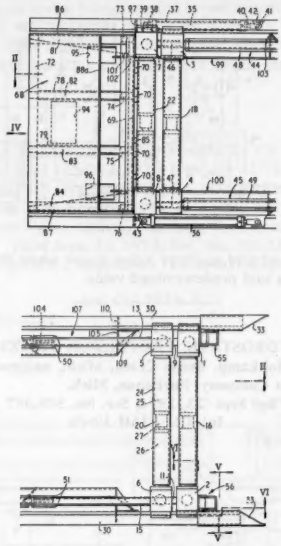
1. A water gate for a waterway including, in combination
a waterway,
a floating gate across said waterway, in its closed position the distal end thereof being disposed in a distal recess at one side of the waterway and the opposite end thereof intruding into a proximal recess on the opposite side of said waterway,
a channel at the bottom of the waterway, co-linear with said recesses, the lower portion of said floating gate being disposed in said channel and slidable from its engagement with the distal recess along said channel to enter for its full length into the proximal recess, leaving said waterway open to traffic,
means to slide said floating gate from its closed position to its open position and to return it to its closed position, and means to maintain said gate in a level aspect during the traverse from the closed to the open position and its return to the closed position, and
compartments in said gate fillable with fluid to maintain said gate in an optimum flotation position relative to the surface of the water in the waterway, and
said floating gate being free to rise and fall within said channel and said proximal and distal recesses as the level of water in the waterway changes.

3,916,629
TRENCH SHORING MACHINES

Alistair Nigel Thompson, 20 Farfield Ave., Knaresborough, Yorkshire, England

Filed June 21, 1974, Ser. No. 481,864
Int. Cl.² E21D 5/12
U.S. Cl. 61—41 A **23 Claims**

1. A trench shoring machine comprising a first framework; a series of longitudinally extending vertically spaced piles arranged along each side of said first framework; guide means guiding said piles for substantially horizontal sliding movement longitudinally of said first framework; first drive means for longitudinally advancing said piles with said first framework held stationary; and holding means for positively holding

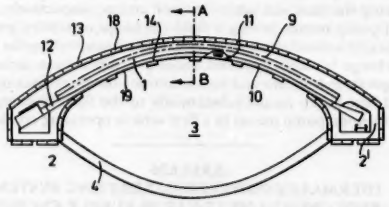


said piles in their advanced positions and advancing said first framework relative to said piles.

3,916,630
TUNNELING METHODS AND APPARATUS

Javier Arsuaga, Madrid, Spain, assignor to Gewerkschaft Eisenhutte Westfalia, Wethmar near Lunen, Germany

Filed Mar. 21, 1974, Ser. No. 453,474
Claims priority, application Spain, Mar. 27, 1973, 414134
Int. Cl.² E21D 9/08
U.S. Cl. 61—42 **3 Claims**



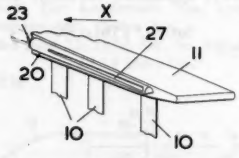
1. A method of driving underground tunnels having an arched roof profile, comprising the steps of:
a. driving two parallel channels, one at each side of the intended tunnel profile,
b. forming an arched channel interconnecting the two parallel channels,
c. assembling in the arched channel a framework comprising a plurality of interconnected sections, said framework resting upon skids and being covered by sharp ended shield elements, an arched conveyor being supported on said skids and extending between the two parallel channels,
d. advancing selected groups of the shield elements alternately, to cut away the upper side of an arcuate channel and form a natural roof,

e. reciprocating a planer back and forth along the conveyor between the two parallel channels to remove material from beneath the shield elements, the material removed being conveyed along the conveyor to at least one of the parallel channels,
f. monitoring the stresses in the framework sections,
g. applying counteracting forces between the sections in response to the monitoring, whereby the arched channel is extended, and
h. filling the extended arched channel with a lining material.

3,916,631
MINE ROOF SUPPORT EQUIPMENT

James Malcolm Agnew, and Granville Collis James, both of Burton-on-Trent, England, assignors to Coal Industry (Patents) Limited, London, England

Filed Mar. 1, 1974, Ser. No. 447,341
Claims priority, application United Kingdom, Mar. 16, 1973, 12738/73
Int. Cl.[2] E21D *23/00*
U.S. Cl. 61—45 D **11 Claims**



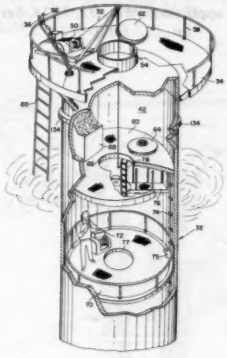
1. Mine roof support equipment comprising at least one extensible hydraulic prop, a roof canopy supported by the prop, and air flow inducing means for extracting dust from near the roof canopy, the air flow inducing means including a member mounted along the roof canopy, an air-inlet means in the member for admitting dust and means mounted in the member to draw dust through the air-inlet means.

3,916,632
TELESCOPIC CAISSON WITH INTERMEDIATELY POSITIONED WELLHEAD

John P. Thomas, New York, N.Y., assignor to Interseas Associates, New York, N.Y.

Filed May 6, 1974, Ser. No. 467,236
Int. Cl.[2] E02B *17/04;* **E02D** *29/00;* **E21B** *15/02*
U.S. Cl. 61—46 **10 Claims**

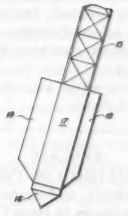
1. Apparatus for offshore oil production comprising:
a. a fixed caisson permanently mounted on the sea floor,
b. a telescopic caisson of lesser diameter than said fixed caisson and adapted to move vertically within and relative to said fixed caisson from a retracted position substantially below the water surface to an extended position above the water surface,
c. at least one wellhead mounted within said fixed caisson at a position intermediate the height thereof, the height being such as to permit diver service of said wellhead,
d. means for locking said telescoping caisson in said retracted or extended position, and
e. means for maintaining ambient pressure in said telescoping caisson when the same is in its extended and retracted position.



3,916,633
MEANS FOR ALTERING MOTION RESPONSE OF OFFSHORE DRILLING UNITS

Peter M. Lovie, and Edwin L. Lowery, both of Houston, Tex., assignors to Engineering Technology Analysts, Inc., Houston, Tex.

Filed Aug. 24, 1973, Ser. No. 391,070
Int. Cl.[2] E02B *17/00;* **E02D** *5/72*
U.S. Cl. 61—46.5 **2 Claims**



1. An offshore drilling unit of the self-elevating type having a floatable hull; a plurality of legs movable from a raised position, in which the legs are supported by said hull, to a lowered position, in which said hull is supported by said legs; and means for lowering said legs from said raised position to said lowered position for engagement with the floor of a body of water in which the unit is deployed; said legs comprising: a plurality of longitudinal chord members interconnected by bracing members and connected at the lower end thereof to a spud tank for said engagement with said floor of said body of water, and motion response means attached to said legs above said spud tank for altering the response of said unit to movement of said body of water, said motion response means comprising plating on the sides of the lower portions of said legs forming at least one enclosed compartment in which selected volumes of liquid may be introduced and removed to alter the natural frequency of said drilling unit, the longitudinal dimension of the portion of said legs provided with said plating lying in the range of 3 to 15 times the lateral dimension of said legs.

3,916,634

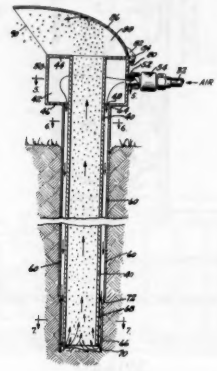
METHOD FOR FORMING HOLES IN EARTH AND SETTING SUBTERRANEAN STRUCTURES THEREIN

Roy J. Woodruff, 354 Menke Road, Michigan City, Ind. 46360

Division of Ser. No. 340,238, March 12, 1973, Pat. No. 3,825,082. This application Mar. 21, 1974, Ser. No. 453,255

Int. Cl.[2] E02D 7/24

U.S. Cl. 61—53.74 3 Claims



1. The method of installing a subterranean structure in the earth consisting of the steps of

lowering an open-ended rigid tube endwise into the earth

discharging gas under a pressure of at least 75 psi substantially uniformly around and below the lower end of the tube for flow into the lower end of the tube while lowering the tube to thereby displace soil and discharge displaced soil and gas upwardly through the tube until the tube is lowered to selected depth,

lowering a subterranean structure into the tube at said selected depth, and

withdrawing the tube while said subterranean structure remains at selected depth.

3,916,635

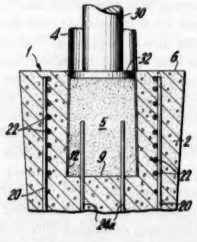
PILING AND METHOD OF INSTALLATION

Henry J. Lynch, Cedarhurst, and Leonard Fleishman, Oceanside, both of N.Y., assignors to Horn Construction Co., Inc., Merrick, N.Y.

Filed Dec. 13, 1972, Ser. No. 314,566

Int. Cl.[2] E02D 5/30, 5/38, 5/50

U.S. Cl. 61—53 27 Claims



1. A cast-in-place, thin-walled piling, comprising:

an enlarged, pile driving base member having a leading end surface adapted to penetrate one or more soil strata and a trailing end surface,

said pile driving base member further including open socket means formed in said trailing end surface,

said socket means terminating at a point intermediate said leading and trailing ends of said pile driving base member, and

the base of said socket means being identical in shape to that of the open top thereof and of slightly larger dimension so that the side walls thereof taper outwardly from said open top to said base thereof;

a thin-walled, tubular casing shell having a leading end portion located in said socket means formed in said pile driving base member and a trailing end portion located at approximately ground level;

compacted means holding the entire circumferential surface of said leading end of said casing shell in fixed expanded, liquid-sealing engagement with the tapered side walls of said socket means formed in said pile driving base member; and

bearing support material substantially filling said casing shell.

3,916,636

METHOD OF AND APPARATUS FOR BURYING STIFFALLED PIPES IN THE GROUND

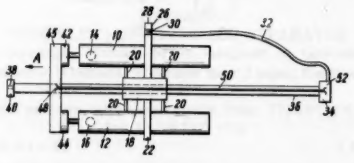
Friedrich Wilhelm, Kantstrasse 100, 28 Bremen, Germany

Filed July 15, 1974, Ser. No. 488,451

Claims priority, application Germany, July 17, 1973, 2336302

Int. Cl.[2] F16L 1/00

U.S. Cl. 61—72.7 13 Claims



1. An apparatus for burying a stiffwalled pipe in the ground, comprising: fluid-operable means for engagement with the pipe and adapted to propel the latter in a substantially horizontal direction, means for introducing liquid into the pipe for discharge from said pipe at the front end thereof, when looking in said direction, conduit means connected to said fluid-operable means for introducing water thereinto, and means interconnecting said conduit means with said means for introducing liquid into said pipe, for introducing at least a portion of the water passing through said fluid-operable means into said pipe.

3,916,637

ELECTRICAL DOMESTIC FREEZER

Paul A. Marrie, 12, rue Felix Tisserand, 21000 Dijon, France

Filed Sept. 25, 1972, Ser. No. 292,121

Claims priority, application France, Sept. 27, 1971, 71.34689; Aug. 10, 1972, 72.28855

Int. Cl.[2] A23G 9/00

U.S. Cl. 62—136 21 Claims

1. A device for making ice-cream or the like comprising:

a ring shaped tank;

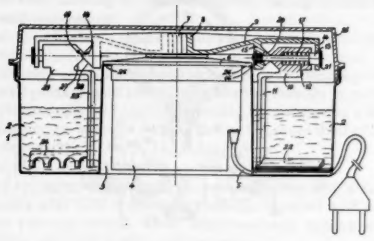
a housing at the centre of said tank;

a motor drive-reduction device in said housing;

an arm driven by said device;

a mixer blade support carrying a blade arm for a mixer blade; and

means mounting the mixing blade support on said arm to cause rotation of the blade around the tank, said means being adapted to permit the blade to be lifted from a



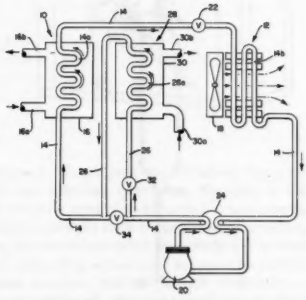
working position in which it is immersed in the preparation to be frozen to a raised position in which the blade is lifted out of said preparation, the raising of the blade by its mounting means being controlled automatically by the torque generated on the blade by the hardening of the ice in the course of setting.

3,916,638

WATER TO AIR HEAT PUMP UTILIZING HEAT RECOVERY WATER HEATING

A. Carl Schmidt, Fort Lauderdale, Fla., assignor to Weil-McLain Company, Inc., Dallas, Tex.

Filed June 25, 1974, Ser. No. 483,012
Int. Cl.[2] F25B *27/02*
U.S. Cl. 62—238 **3 Claims**



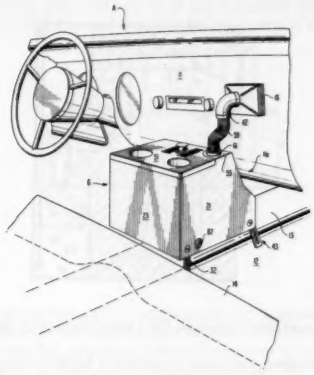
1. A heat pump comprising a first heat exchanger adapted to evaporate a heat exchange fluid and including means for passing air in a heat exchange relation to said fluid, a second heat exchanger adapted to condense said fluid and adapted for connection to an external cooling tower for circulating a liquid in a heat exchange relation to said fluid, a compressor unit connected to the outlet of said first heat exchanger, a third heat exchanger adapted to condense said fluid, first and second conduit means adapted to connect the outlet of said compressor unit to said second heat exchanger and to said third heat exchanger, respectively, first and second valve means connected in said first conduit means and said second conduit means, respectively, for selectively controlling the flow of fluid from said compressor unit to said second heat exchanger and to said third heat exchanger, third conduit means connecting the outlet of said third heat exchanger directly to said second heat exchanger, and fourth conduit means connecting the outlet of said second heat exchanger directly to said first heat exchanger.

3,916,639

AUTOMOBILE COOLER AND RECEPTACLE

Richard K. Atkinson, 175 Karen Drive, West Columbia, S.C. 29169

Filed July 12, 1974, Ser. No. 488,016
Int. Cl.[2] B60H *3/04*
U.S. Cl. 62—239 **10 Claims**



1. A combination cooler and receptacle for an automobile having a dashboard, a front seat, a transmission hum in underlying spaced relation to the central portion of said dashboard and an air conditioning unit with an outlet in said dashboard, which cooler and receptacle is comprised of:

1. A container of insulating material having a front wall arranged to be installed adjacent to the front seat, an inclined rear wall arranged to be installed adjacent to the dashboard so as to extend forwardly underneath said dashboard in the space between the dashboard and said transmission hump, a pair of side walls, a botttom wall, and an open upper end, said walls being of a multi-layer construction with an inner layer of foam plastic material defining a watertight interior accessible through said open end and an outer supporting layer of substantially rigid plastic material and the outer layer of said bottom wall having an aperture adjacent to each side wall near said front wall and an aperture adjacent to each side wall near said rear wall;

2. Closure means of insulating material arranged to be detachably positioned in snug-fitting, closing relationship with said container open end and including an upper surface having at least one downwardly depending recess formed integrally therein for accommodating a hand-sized vessel or the like, conduit means for introducing refrigerated air from said air conditioning outlet into said container interior, and air outlet means having an adjustable damper for regulating the flow of air out of said container;

3. A pair of front leg members with one mounted on the inside of the rigid outer layer of each side wall between said inner and outer layers in spaced relation to said front bottom wall aperture and arranged for sliding movement through said aperture for vertical adjustment;

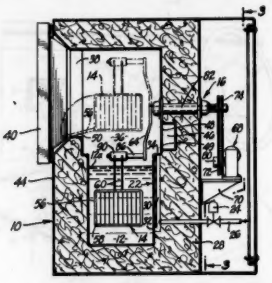
4. A pair of rear leg members with one mounted on the inside of the rigid outer layer of each side wall between said inner and outer layers in spaced relation to said rear bottom wall aperture and arranged for sliding movement through said aperture for vertical adjustment, said rear leg members being angularly disposed for sliding movement substantially parallel to the incline of said wall; and,

5. Clamping means operable from the exterior of said container for releasably securing said leg members in selected positions for vertical adjustment of said container.

3,916,640
PORTABLE CRYOGENIC FLUID IMMERSION-TYPE FREEZER

Ivan Rasovich, 1832 1/2 N. Berendo St., Los Angeles, Calif. 90022

Filed June 10, 1974, Ser. No. 477,775
Int. Cl.² F25D *23/02*
U.S. Cl. 62—266 7 Claims



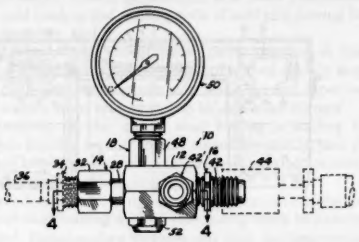
1. A portable cryogenic fluid immersion-type freezer comprising:
an insulated enclosure including a lower compartment for containing a bath of cryogenic fluid, an upper compartment open to said lower compartment for containing vapor from said bath, and a door for access to said upper compartment;
a gas exhaust duct in said enclosure having an inner end open to said upper compartment with a lowermost edge below a lowermost edge of said door, and having an outer end open to a side of said enclosure such that gas vapor in said upper compartment flows into said exhaust duct and by gravity out of said enclosure rather than out through said door when open;
support means in said enclosure;
drive means operable from outside said enclosure for reciprocating said support means between said upper compartment adjacent said door where articles to be frozen may be placed thereon and frozen articles may be removed therefrom through said door when open, and said lower compartment where articles on said support means are fully immersed in said bath; and
an external exhaust port and fan means having an open intake coupled to said gas exhaust duct for simultaneously drawing cold gas from inside said enclosure through said inner end of said gas exhaust duct and relatively warm gas from outside said enclosure through said outer end of said gas exhaust duct and having an outlet connected to said exhaust port for discharging said cold gas and said warm gas through said external exhaust port such that said warm gas heats said cold gas at said intake of said fan means.

3,916,641
REFRIGERANT SYSTEM CHARGING AND EVACUATING MANIFOLD

John W. Mullins, P.O. Box 20524, Oklahoma City, Okla. 73120

Filed Oct. 29, 1974, Ser. No. 518,822
Int. Cl.² F25D *45/00*
U.S. Cl. 62—292 4 Claims

1. A manifold for evacuating and charging a closed refrigerant system with fluid, said refrigerant system having a refrigerant line provided with an access fitting containing a normally closed valve which must be depressed to open, comprising:
a body having a passageway therethrough;
a first connector means connecting one end of the passageway with said access fitting;
second connector means adapted to connect one end of a charging-evacuating hose with the other end of the passageway,
said body having a transverse bore intersecting the passageway;



cam shaft means within the transverse bore; and,
plunger means interposed between said access valve and said cam shaft means within the passageway.

3,916,642
REFRIGERANT DRYER SERVICE VALVE

John W. Mullins, P.O. Box 20524, Oklahoma City, Okla. 73120

Filed Aug. 12, 1974, Ser. No. 496,790
Int. Cl.² F25B *45/00*
U.S. Cl. 62—292 1 Claim

1. A service valve in combination with a refrigerating system dryer, said dryer having arcuate converging end wall surfaces, the improvement comprising:
a generally cylindrical centally bored housing having wrench flats intermediate its ends and a diametrically reduced periphery forming a relatively thin wall having a free end surface at one end portion,
said housing being counterbored from its thin wall end to form an annular tapered shoulder intermediate its ends facing toward said thin wall portion,
said housing having external threads extending between said wrench flats and said thin wall portion,
the other end portion of said housing being diametrically reduced and connected in end abutting relation with one arcuate end wall of said dryer by brazing;
a tubular core, having a length slightly greater than the spacing between the free end surface of said housing thin wall portion and said other end of said housing, cooperatively received coaxially by the bore of said housing.

said core having a diametrically reduced tapered end portion converging toward the tubular member wall to be pierced,

said tapered end portion terminating in a beveled end surface forming a wall piercing tip,

said core having an external beveled surface intermediate its ends forming an annular shoulder facing toward the wall piercing tip,

said core having a diametrically reduced peripheral portion adjacent its end opposite said line piercing tip forming an annular shoulder adjacent the housing thin wall portion, said core having internal threads at its end portion opposite said wall piercing tip and having a seat formed on its inner wall surface at the inner limit of the threads;

an air valve sealing with the seat in said core; and,

a cap engaging the threads on said housing and axially moving said core toward said tubular member wall in a wall piercing action while simultaneously seating and sealing said core within said housing.

3,916,643

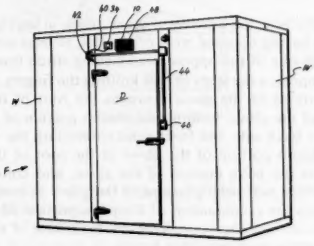
PRESSURE RELEASE PORT FOR A WALK-IN FREEZER OR THE LIKE

Edward A. Brown, Salisbury, N.C., assignor to W. A. Brown & Son, Inc., Salisbury, N.C.

Filed Dec. 2, 1974, Ser. No. 528,736

Int. Cl.² F25D *17/04*

U.S. Cl. 62—410 **5 Claims**



1. A pressure release port for a walk-in freezer or the like comprising an aperture extending through a wall of said freezer, an electric light bulb mounted in said aperture, means for energizing said light bulb to create heat in said aperture for minimizing moisture and frost accumulation in said aperture, an air filter extending across said aperture to clean air passing through said aperture and to provide resistance to the free flow of air therethrough, thereby enhancing the heating effect of said light bulb therein.

3,916,644

DEHUMIDIFIER WITH A PLATE-TYPE EVAPORATOR

Gamal El Din Nasser, Puchheim, Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed Aug. 2, 1974, Ser. No. 494,235

Claims priority, application Germany, Aug. 7, 1973, 2340003

Int. Cl.² F25D *17/06*

U.S. Cl. 62—428 **9 Claims**

1. A dehumidifier comprising:

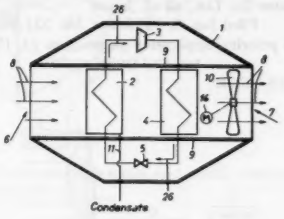
a housing forming a passage having an inlet and an outlet;

means for passing a current of humid gas through said passage from said inlet to said outlet;

a plate-type evaporator in said passage traversed by said current;

a pl..te-type condenser in said passage traversed by said current after it has passed through said evaporator, said evaporator and said condenser being connected in a closed coolant circuit;

pump and valve means in said circuit for compressing a coolant fluid and feeding same to said condenser and thereafter feeding same to said evaporator, said evaporator being formed of a stack of generally similar and generally planar plates each formed with a plurality of regular corrugations having crests spaced from the plane of the respective plate and valleys at the respective plane, said plates being disposed in pairs with the valleys of one plate



of each pair turned inwardly toward and registering with the valleys of the other plate of the pair, whereby a plurality of parallel passages are formed between the plates of each pair between the corrugations thereof, the crests of each plate turned toward plate being in line with the valleys thereof, whereby a plurality of nonstraight passages transverse to said parallel passages are formed between confronting plates of adjoining pairs, each of said plates being formed with a plurality of ridges projecting from the respective plate plane and abutting a respective ridge of the adjoining plate of the neighboring pair.

3,916,645

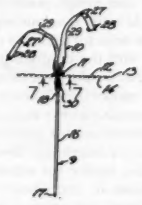
DEVICE FOR REPAIRING SNAGGED KNITWEAR FABRICS

David D. Hart, Box 766, Connell, Wash. 99326

Filed Oct. 26, 1973, Ser. No. 410,211

Int. Cl.² D04B *17/02*

U.S. Cl. 66—1. R **5 Claims**



1. A snag repair device for removing a snag protruding from an exterior surface of a knitwear fabric comprising:

means for forming an opening through the knitwear fabric adjacent the snag;

flexible snag engaging means interconnected with said means for forming an opening; said flexible snag engaging means having at least two elongated flexible gripping elements of finite length extending outward from the opening forming means in an unlooped manner and terminating in free ends for engaging each other and the snag and drawing the snag into the opening as said elongated flexible elements are drawn through the opening from said exterior surface without either of the flexible gripping elements forming a loop about the snag; and

wherein each flexible element is comprised of an elongated sheet of flexible material having face surfaces with longitudinal side edges in which the cross sectional dimension between the longitudinal side edges is substantially

greater than the dimension of said opening whereby said face surfaces are caused to laterally compressed forming a plurality of folds to grip said snag within the folds as said elements are drawn through said opening.

3,916,646

ELECTRONIC PATTERNING PROCESS FOR A KNITTING MACHINE

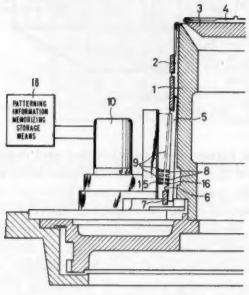
Kazue Takigawa, Shizuoka, and Toshio Ueno, Higashiyamato, both of Japan, assignors to Daitoseiki Co. Ltd.; Japan Society for the Promotion of Machine Industry and Nippon Pulsmotor Co. Ltd., all of, Japan

Filed Jan. 8, 1973, Ser. No. 321,861

Claims priority, application Japan, Jan. 21, 1972, 47-8093

Int. Cl.[2] D04B *15/78*

U.S. Cl. 66—50 R **1 Claim**



1. A circular knitting machine comprising a rotatable cylinder having a plurality of longitudinally extending circumferential grooves therein, latch needles positioned in said grooves adjacent the top of the cylinder, selector jacks positioned in the grooves at the bottom of said cylinder each having patterning butts, an operating butt and a knitting butt thereon with the knitting butt being in engagement with the latch needles whereby on raising each of the individual selector jacks the individual latch needle associated therewith will be raised into a knitting position, cam means positioned adjacent the selector jacks engageable with the knitting butts of the selector jacks for moving the selector jacks up on rotation of the cylinder in accordance with the configuration of the cam means, and structure for electronic patterning processing including storage means for memorizing pattern information, a rotary stepping motor responsive to the storage means in accordance with the pattern memorized for bi-directional rotation in two angular directions a predetermined amount, a spindle secured to the rotary stepping motor for rotation into and out of the two angular directions in accordance with actuation of the stepping motor, a crank arm secured to the spindle extending perpendicular to the spindle and a selector lever extending substantially perpendicularly to the crank arm and spindle and radially of the cylinder pivotally secured at one end to the crank arm for rotation about a fixed pivot axis with respect to the crank arm, the other end of which is positioned adjacent the operating butts of the selector jacks on rotation of the cylinder, said other end having a beveled edge for engagement with the operating butts of individual selector jacks as they rotate toward the selector lever whereby on actuation of the rotary stepping motor to turn the crank arm through a predetermined arc toward the cylinder the selector lever is moved toward the cylinder to sequentially engage the operating butts of selector jacks moved past the selector lever whereby the selector jacks are pivoted toward the cylinder to prevent engagement of the knitting butts with the cam means and thus prevent movement of the selector jacks and latch needles into a knitting position and a plurality of manually patterned additional selector levers positioned radially outward from and adjacent the cylinder which are adapted to engage the patterning butts of the selector jacks to selectively cause the selector jacks to pivot inwardly of the cylinder and prevent movement of the latch needles into a knitting position in accordance with the manual patterning of the additional selector levers whereby both manual and electronic patterning to produce actuation of the selector jacks is possible simultaneously to improve the patterning possibilities of the knitting machine.

3,916,647

GLOVE KNITTING METHOD

Masahiro Yabuta, Wakayamaken, Japan, assignor to Shima Idea Center Company Limited, Japan

Filed June 6, 1974, Ser. No. 476,772

Int. Cl.[2] D04B *7/34*

U.S. Cl. 66—65 **8 Claims**

1. A method for knitting a glove using a lateral knitting machine having opposed rows of needles, at least some of the needles in one of the opposed rows being stitch transfer needles, comprising the steps of first knitting the fingers, back and palm portions of the glove down to the root of the thumb portion of the glove, knitting the thumb portion of the glove to have a back side and front side, connecting the back side of the thumb portion of the glove at the root of the thumb portion to the palm portion of the glove, and continuing to knit the back and palm portions of the glove to complete the glove, with the continuation of the palm portion of the glove at the thumb portion being from the front side of the thumb portion at the root thereof.

3,916,648

KNITTING MACHINE CAM SYSTEM WITH PRESSING OFF MEANS

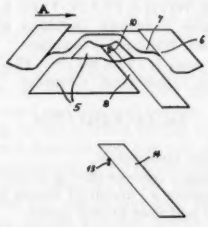
Max Williams Betts, Coventry, and Frank Robinson, Borrowash, both of England, assignors to Courtaulds Limited, London, England

Filed Jan. 31, 1973, Ser. No. 328,381

Claims priority, application United Kingdom, Feb. 2, 1972, 4990/72

Int. Cl.[2] D04B *7/00, 7/10*

U.S. Cl. 66—75 **5 Claims**



1. A cam system for a flat knitting machine having independently operable needles, said cam system comprising

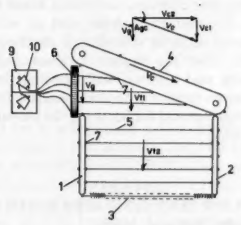
a. a raising cam for contacting butts associated with needles of said machine to raise said butts and needles so that the needles clear yarn loops held thereon and take yarn for knitting,
b. a stitch cam for contacting raised butts to lower the associated needles after they have taken yarn and cause them to knit,
c. a cam track between said raising cam and said stitch cam for said butts to descend before the associated needles take yarn, and
d. directing means separate from said cam track for lowering selected needles raised to clearing height by said raising cam and routing the associated butts into said cam track.

3,916,649

WEFT INSERTING APPARATUS FOR A WARP KNITTING MACHINE

Karl Kohl, Chlorodont Str. 10, Obertshausen, Germany (6053)

Filed Mar. 27, 1975, Ser. No. 562,407
Claims priority, application Germany, Apr. 10, 1974, 2417492
Int. Cl.² D04B *23/06*
U.S. Cl. 66—84 A **5 Claims**



1. An improved weft inserting apparatus for use with a warp knitting machine comprising:
a plurality of weft thread supplying spools;
a flexible band type of thread guide means for moveably guiding of said threads, said threads passing through said thread guide means;
an endless weft tensioning means for taking said threads from said guide means and drawing them away therefrom; and,
a first and second endless band means for taking each individual thread from said thread guide means and said tensioning means respectively and presenting said threads to said warp knitting machine.

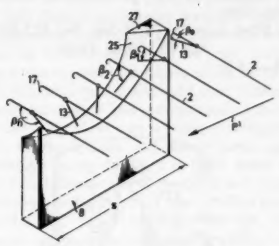
3,916,650

DEVICE FOR OPENING OR CLOSING LATCHED NEEDLES OF A KNITTING MACHINE

Techniker Gerhard Schmidt; Antonius Vinnermann, both of Stuttgart, and Rainer Bender, Echterdingen, all of Germany, assignors to Franz Morat GmbH, Stuttgart, Germany

Filed May 23, 1974, Ser. No. 472,880
Claims priority, application Germany, May 28, 1973, 2327228
Int. Cl.² D04B *15/08*
U.S. Cl. 66—111 **18 Claims**

1. In a knitting machine comprising a movable needle bed, at least one knitting needle mounted thereon; a latch pivotally mounted on said needle, said latch having a tip movable to an open position and a closed position with respect to said needle, said tip moving along a curved path when said latch is pivoted to one of said positions; and magnetic means mounted on said machine in a fixed position and having a curved face adjacent said needle bed, the path of said tip and the curved face of said magnetic means having substantially the same curvature, said face magnetically attracting and guiding said



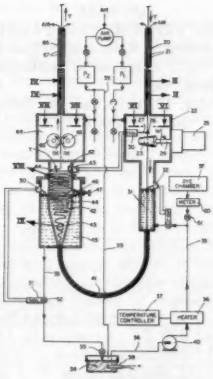
latch to one of said positions when said needle bed is moved past said magnetic means.

3,916,651

CONTINUOUS BULKING AND HEAT SETTING OF YARN

George Alan Carruthers, Caton, England, assignor to Turbo Machine Company, Lansdale, Pa.

Filed Nov. 28, 1973, Ser. No. 419,536
Int. Cl.² D06B *3/04, 21/00, 23/18*
U.S. Cl. 68—5 E **19 Claims**

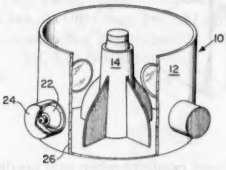


1. In an apparatus for continuously bulking a texturized multifilament yarn, the combination which comprises: means providing a gaseous pressurized inlet zone into which said yarn is conducted, said gaseous inlet zone having a gas outlet, for escape of gas from said gaseous inlet zone, said gas outlet defining an inlet for said yarn into said inlet zone such that said yarn enters said inlet zone countercurrently with respect to the escaping gas, means providing a pressurized hot liquid zone in contact with said inlet zone and into which the yarn is conducted from said inlet zone, the pressure in said pressurized liquid zone being approximately equal to that in said gaseous inlet zone, said pressurized liquid zone including a yarn-relaxing chamber wherein the yarn tension is relaxed, means for introducing the liquid into said relaxing chamber concurrently with the yarn whereby said yarn travels in a relaxed condition concurrently with said pressurized hot liquid through said relaxing chamber, and means for continuously withdrawing said yarn from said liquid zone after said relaxation.

3,916,652
WASHING MACHINE

Peter Roscoe Hartley Speakman, Newcastle-upon-Tyne, England assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed June 26, 1973, Ser. No. 373,697
Int. Cl.[2] D06F *39/04*
U.S. Cl. 68—13 R 9 Claims

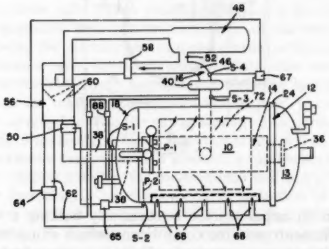


1. A machine for washing textile materials comprising a vessel for holding an aqueous wash liquor containing photoactivators and the textiles to be washed, means for providing relative movement between the wash liquor and the textiles, and at least one source of visible light secured to the machine and directed so as to irradiate at least part of the wash liquor and textiles, the said light source having a power of at least 100 watts, and emitting light of a wavelength of at least 640 nm.

3,916,653
FABRIC TREATMENT APPARATUS

Thomas B. West; Ernest V. King, and William S. Hindman, all of Burlington, N.C., assignors to Burlington Engineering Sales Co., Graham, N.C.

Filed Mar. 13, 1973, Ser. No. 340,696
Int. Cl.[2] D06B *5/22*
U.S. Cl. 68—15 12 Claims

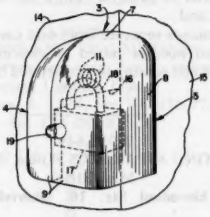


1. A fabric treatment apparatus comprising a vessel having a closed end and an open end, displaceable closure means for said open end for sealing said vessel and closure means in fluid tight relationship, a hollow, perforated beam, having fabric wound thereon, positioned within said vessel, means for supporting said fabric beam, a fluid pumping system including an inlet conduit extending into said vessel and communicating with said beam for forcing fluid simultaneously into said hollow beam and generally radially outwardly through said perforated beam and fabric wound thereon and into said vessel around said beam and fabric to penetrate said fabric, said fluid pumping system including a by-pass system regulating the fluid flow through said inlet conduit and into said beam for controlling the fluid pressure within the beam having fabric wound thereon.

3,916,654
PADLOCK PROTECTOR

Karl E. Mudge, Jr., 1219 Bender Ave., Holly Hill, Fla. 32017

Filed Jan. 8, 1975, Ser. No. 539,499
Int. Cl.[2] E05B *67/38*
U.S. Cl. 70—56 6 Claims

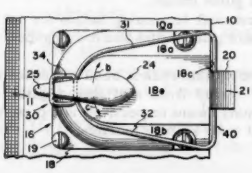


1. A padlock protector comprising a hood having an internal cavity opening through the bottom of the hood, said hood being composed of two halves each a mirror image of the other and each having an internal wall provided with an opening, at least one of said hood sections being adapted to be secured to a movable closure, said other hood section being adapted to be secured to a door post or second closure whereby said hood sections will assume abutting engagement with one another when the closure or closures are in a closed position and with said internal wall openings in registration with one another to receive a padlock shackle for locking the hood sections together and for securing the closure or closures in a closed position.

3,916,655
DOOR SECURING APPARATUS

Charles R. Racobs, Saginaw, Mich.

Division of Ser. No. 311,279, Dec. 1, 1972, Pat. No. 3,826,117.
This application July 22, 1974, Ser. No. 490,587
Int. Cl.[2] E05B *55/00;* G05G *5/00*
U.S. Cl. 70—145 4 Claims



1. In combination:
a door lock for a door swingable between open and closed positions including
a longitudinally extending bolt longitudinally movable between an extended door-locking position to preclude swinging of said door and a retracted position permitting the door to be swung between said closed and open positions;
key operated, bolt operating means, receiving a key on one side of said lock, for moving said bolt between said extended and retracted positions;
manually operable, bolt operating means including a handle on the other side of said lock, swingable about an axis transverse to said longitudinal bolt, for moving said bolt between said retracted and extended positions; and
means for preventing the unauthorized turning of said handle about said axis including
a cover overlying said handle means;

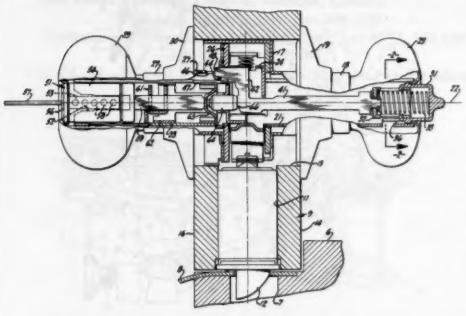
means for removably coupling said cover to one of said door and said lock; and

key operated means, mounted on said cover and adapted to receive a key on the side of said lock opposite said one side, for turning said handle to move said bolt between said extended position and said retracted position.

3,916,656
SECRET LATCH

Ernest L. Schlage, Burlingame, Calif., assignor to Schlage Lock Company, San Francisco, Calif.

Filed July 1, 1974, Ser. No. 484,773
Int. Cl.² E05B *13/08, 63/16*
U.S. Cl. 70—148 **18 Claims**

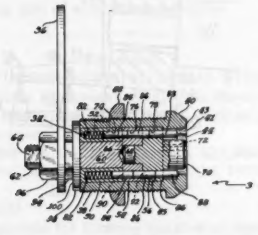


1. A secret latch comprising a lock frame adapted to be mounted on a door, a bolt mounted on said frame for movement between a locking position and an unlocking position, a knob, means for mounting said knob for rotation on said lock frame, means for moving said bolt out of said locking position upon rotation of said knob, a key mechanism, means for mounting said key mechanism for rotation and for axial movement relative to said lock frame, means for moving said bolt out of said locking position upon rotation of said key mechanism, means for coupling said knob to said lock frame for precluding rotation of said knob relative to said lock frame, and means operable upon translation of said key mechanism for uncoupling said knob from said lock frame.

3,916,657
DOUBLE KEY AXIAL SPLIT-PIN TUMBLER-TYPE LOCK

Robert L. Steinbach, Chicago, Ill., assignor to Chicago Lock Co., Chicago, Ill.

Filed Feb. 11, 1975, Ser. No. 548,921
Int. Cl.² E05B *27/08, 35/08*
U.S. Cl. 70—338 **5 Claims**



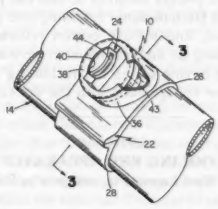
1. In combination with an axial split-pin tumbler-type lock having a lock cylinder, a three-part plug assembly inserted in the cylinder, and a plurality of tumbler assemblies carried by the plug assembly, said plug assembly including a rear sleeve part fixed to the cylinder, a rotatable intermediate spindle part including a lock shaft extending through the sleeve part, a rotatable front drive part, and a post fixed to the drive part and having means drivingly engaging a key for rotation of the drive part by turning the key, said plug assembly parts each having a plurality of longitudinal bores arranged for alignment with the bores in the remaining parts in an initial disposition of said parts, said aligned bores being asymmetrically disposed about the longitudinal axis of the plug assembly, whereby the drive part may be rotated relative to the other parts and provide an inoperative second disposition of the parts wherein a blank area of the drive part is disposed over aligned bores in the spindle and sleeve parts and prevents access thereto, while at least one bore of the drive part is disposed in alignment with aligned bores in the spindle and sleeve parts, one of said tumbler assemblies being disposed in each series of aligned bores in said initial disposition of the parts and each tumbler assembly including spring means, a rear tumbler pin, an intermediate tumbler pin, and a front tumbler pin, said spring means yieldingly urging the several pins forwardly in the bores in said initial disposition of the parts, whereby a first interfacial plane between the sleeve and spindle parts, and a second interfacial plane between the spindle and drive parts are bridged by tumbler pins to secure the parts against relative rotation, and the tumbler pins in each series of aligned bores may be shifted longitudinally to cause the interface between the rear pin and the intermediate pin to coincide with said first plane while said second plane is bridged by at least one pin to thereby free the drive and spindle parts for conjoint rotation relative to the sleeve part, or alternatively to cause the interface between the intermediate pin and the front pin to coincide with said second plane while at least the interface between said aligned bores having said blank area thereover in said second disposition of the parts is bridged by one of said pins to thereby free the drive part for rotation relative to the spindle part and the sleeve part:

first and second keys each adapted for drivingly engaging said post and having different bittings engaging said front tumbler pins, the bittings of the first key being adapted for shifting the tumbler pins longitudinally in each series of aligned bores so as to free the drive and spindle parts for cojoint rotation by the key from said initial disposition of the parts to operate the lock, the bittings of the second key being adapted for shifting the tumbler pins longitudinally in each series of aligned bores so as to free only the drive part for rotation by the key from said initial disposition of the parts to said inoperative second disposition of the parts, and said second key being removable from the lock in said second disposition of the parts to leave the parts secured against relative rotation, whereby the lock is rendered inaccessible for direct picking and the second and first keys must be employed successively in that order to operate the lock.

3,916,658
PROTECTING

John D. A. Barry, 146 Winthrop St., Brookline, Mass. 02146

Filed Mar. 10, 1975, Ser. No. 556,548
Int. Cl.² B60R *25/02*
U.S. Cl. 70—417 **12 Claims**



1. A protective device for preventing removal from an automobile steering column of an ignition lock of the type including a rotatable key-controlled cylinder, the lock being mounted with the axis of rotation of the cylinder generally

transverse to the axis of the column, said device comprising:

a plurality of arcuate collar portions adapted to be connected to each other to form a continuous band encircling the portion of the column in which the lock is mounted; and,

a circular cap adapted to be secured by the band in position overlying the outer end of the lock with the cap rotatable relative to the band about an axis generally coaxial with the axis of rotation of the cylinder,

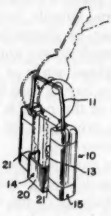
the cap including a key opening extending through the central portion thereof to permit a key to be inserted through the cap and into the cylinder, and

portions of the band being positioned to overlie and slidingly engage portions of the face of the cap lying in an annular ring radially outwardly of the key opening when the collar portions encircle the steering column and the cap is in position overlying the outer end of the lock.

3,916,659
KEY HOLDER

Norbert Leopoldi, 4180 Marine Drive, Chicago, Ill. 60613

Filed Apr. 5, 1974, Ser. No. 458,179
Int. Cl.² A44B *15/00*; A47G *29/10*
U.S. Cl. 70—456 R **1 Claim**



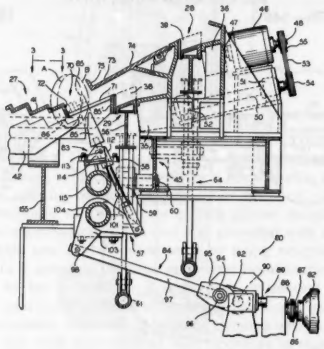
1. A key holder having a body portion and a bail-shaped releasable loop having a cross-bar mounted on the body portion adjacent to the top side of the body portion and adapted to hold a plurality of keys on said cross-bar, an open recess vertically disposed in the front face of said body portion and extending continuously from the top side of the body portion to the bottom side thereof, a pocket member having a horizontal bottom wall and a vertical wall forming an enclosure for the free end of one or more keys extending from said cross-bar through said open recess into the pocket member, said pocket member being pivotally mounted and disposed at least partially in said open recess adjacent to said bottom side of said body portion, spring means operatively connected with said pocket member, and cushion means mounted in said pocket member adapted resiliently to engage and restrain said free end of said one or more keys, said spring means comprising a spring mounted in said body portion and having operative connections with the body portion and with the pocket member and comprising a torsion spring mounted on the pivotal axis of the pocket member to bias the pocket member about such axis, a latch member retaining said pocket member in closed position, and a push button release for the latch member comprising an integral member pivotally mounted in the body portion having spring means biasing the latch member into operative engagement with the pocket member.

3,916,660
COOLING BED APPARATUS

John F. Turner, West Lawn, Pa., assignor to Birdsboro Corporation

Filed May 9, 1974, Ser. No. 468,373
Int. Cl.² B21B *39/20*, *43/00*, *45/02*
U.S. Cl. 72—201 **45 Claims**

1. A cooling bed assembly for simultaneously moving a plurality of elongate metallic products in a first direction, first inlet means extending in a second direction generally normal to said first direction and disposed for receiving from a rolling mill a first one of said products and including first holding means for holding a received product, second inlet means extending generally in said second direction and disposed adjacent said first inlet means for receiving from said rolling mill a second one of said products and including second holding means spaced from said first holding means for holding a received product, discharge means spaced in said first direction from each of said first and second inlet means,

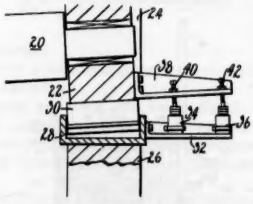


transfer means for simultaneously moving said products in said first direction and from said first and second inlet means to said discharge means, said transfer means including spaced apart product support means each being movable relative to said first and second holding means for simultaneously removing one of said products from each of said first and second holding means and for moving said simultaneously removed products in spaced relation and in said first direction towards said discharge means.

3,916,661
ROLLING MILLS

Thomas Walter Hargreaves, Sheffield, England, assignor to Davy-Loewy Limited, Sheffield, England

Filed Feb. 13, 1975, Ser. No. 549,577
Claims priority, application United Kingdom, Feb. 22, 1974, 8198/74
Int. Cl.² B21B *37/08*
U.S. Cl. 72—31 **4 Claims**



1. A rolling mill stand comprising a housing and upper and lower roll assemblies, at least one piston and cylinder assembly for displacing one of said roll assemblies relative to the other assembly to vary the gap between the roll assemblies, one component of said piston and cylinder assembly being stationary with the housing and the other component being displaceable with said displaceable roll assembly, a pair of

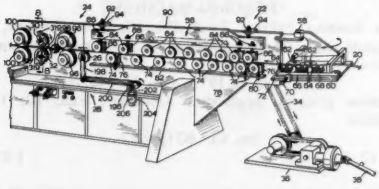
electrical position sensing devices located on the same side of the piston and cylinder assembly but at different distances therefrom and each sensing device having a part stationary with the stationary component of the piston cylinder assembly and a part movable with the movable component, and the electrical outputs of the two sensors being employed to determine the displacement of the central part of the movable component with respect to the stationary component.

3,916,662

APPARATUS FOR STRAIGHTENING AND CUTTING REINFORCING BAR

William T. Arnold, Welland, Canada, assignor to Welland Iron and Metal Company Limited, Welland, Canada

Filed Aug. 6, 1973, Ser. No. 386,185
Claims priority, application Canada, Nov. 14, 1972, 156430
Int. Cl.² B21B *37/04*
U.S. Cl. 72—17 **9 Claims**



2. Apparatus for straightening and cutting curved bar stock to form substantially straight reinforcing bars of selected lengths, the apparatus comprising:

a straightening station for receiving bar stock and straightening the bar stock;

an adjustable measuring mechanism operable by straightening station to measure selected lengths of the bar stock and to provide signals when the said lengths have been measured;

drive means for contact with the bar stock to drive the bar stock through the apparatus;

a cutting station operable to cut the bar stock as the straightened bar stock passes through the cutting station from the straightener to form individual reinforcing bars, the cutting station comprising: a pair of rotatably mounted cutters coupled one to the other for contemporaneous movement to cut the bar stock; a clutch; a clutch actuator operable to engage the clutch for connecting the cutters to the drive means; a tensioning mechanism to limit backlash of one cutter relative to the other cutter; control means responsive to said signals to operate the clutch actuator so that the bar stock is cut into individual reinforcing bars of said selected lengths.

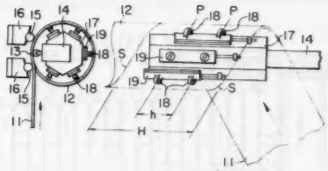
3,916,663

APPARATUS FOR FORMING SPIRAL STEEL PIPE

Kazuma Takeshita, Kitakyushu; Kenji Sato, Hoya, and Yasumi Shimazaki, Kitakyushu, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Jan. 23, 1974, Ser. No. 435,964
Claims priority, application Japan, Jan. 24, 1973, 48-11067
Int. Cl.² B21F *3/02*
U.S. Cl. 72—135 **6 Claims**

1. In an apparatus for forming spiral steel pipe by spirally curling metal strip, the apparatus having a row of interior forming rolls mounted on an interior forming stand and a plurality of rows of exterior forming rolls mounted individually on two exterior forming stands, the improvement comprising a mount extending in the direction of the axis of the interior forming stand and covering the peripherial parts of said interior forming stand other than the part directly supporting the row of the interior forming rolls; a plurality of interior supporting rolls on said mount for contracting the inner surface of the pipe being formed where the edges of the strip have



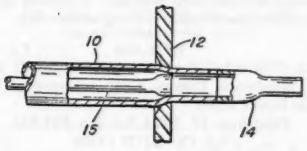
not been welded together, said interior supporting rolls being along a plurality of spiral lines in the peripheral direction of the pipe aligned nearly parallel with the strip edges to be joined for forming the pipe being formed.

3,916,664

STARTING TUBES THROUGH A DRAWING DIE

Samuel Katunich, Baldwin Borough, and George C. McKelvey, Port Vue Borough, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 53,602, July 9, 1970, abandoned.
This application Mar. 20, 1973, Ser. No. 343,077
Int. Cl.² B21C *5/00, 1/16*
U.S. Cl. 72—274 **7 Claims**



1. Apparatus for cold drawing a steel tube comprising:

a drawing die,

a steel tube to be cold drawn through said die, said tube having a substantially circular cross-section and an external diameter greater than the internal diameter of said die;

a mandrel for internally supporting said tube and controlling the internal diameter thereof;

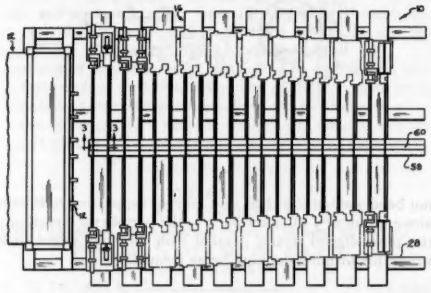
a reusable steel point member removably attached to the exterior of said steel tube, said steel point member being configured to obviate the need for forging said steel tube when the two are attached, said point member having a circular cross-section concentric with its longitudinal axis, one end of said point member removably attached to said steel tube having a large diameter, the other end having a substantially smaller diameter, the external diameter of said member increasing incrementally from one end to the other, the external diameter of the larger end being greater than the internal diameter of said tube to be drawn and having as its upper limit the external diameter of said tube, the external diameter of the smaller end being less than the internal diameter of said die, the larger end of said point member being substantially hollow, the smaller end having a cylindrical shank to provide a gripping surface for a gripping mechanism whereby said point member can be removed from said tube and reused in a subsequent operation.

3,916,665

SPRING FABRICATING MACHINE AND METHOD

William L. Hancock, Lexington, Ky., assignor to Hoover Ball and Bearing Company, Saline, Mich.

Filed Oct. 7, 1974, Ser. No. 512,690
Int. Cl.[2] B21F 1/00
U.S. Cl. 72—306 11 Claims



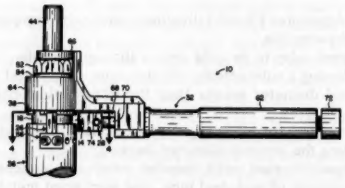
1. A method of forming nonplanar bent wire springs comprising the steps of positioning at a first station a first straight length of wire with its axis horizontally disposed in a horizontal plane, bending simultaneously the opposite end portions of said wire to new locations in said horizontal plane, translating the bent wire to a second station, gripping the bent end portions of said wire and rotating the gripped end portions to in turn rotate the straight portion of the wire about is axis so that the bent portions are displaced to selected positions out of said plane, bending simultaneously in said plane the next end portions of said straight portion and repeating the operations at succeeding stations until said wire is formed to a desired spring configuration without twisting of the wire.

3,916,666

COLD FORMING WAVEGUIDE BENDING TOOL

James O. Woodward, Lomita, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Aug. 27, 1974, Ser. No. 501,018
Int. Cl.[2] B21D 13/00
U.S. Cl. 72—388 9 Claims



1. A rectangular waveguide bending tool comprising:

a forming die having a rectangular waveguide receiving channel curving about the axis of the die and bounded along its radially inner side by a forming wall surface which is cylindrically curved about said axis and along its two adjacent sides by annular wall surfaces which extend radially out from said forming surface in planes normal to said axis;

said channel being open along its radially outer side for receiving a rectangular waveguide of substantially the same cross-sectional dimensions as said channel in an initial position wherein a portion of the waveguide is positioned in said channel with said channel surfaces in seating contact with three sides of said waveguide portion and the remaining outer side of said waveguide portion is exposed through the open outer side of said channel;

a fixed stop on said forming die for contact with the outer side of the waveguide adjacent said portion thereof for retaining said waveguide portion in said channel;

a forming block located in the plane of said channel opposite the open side thereof and having an edge surface defined by line elements parallel to said forming die axis, said edge surface forming a rounded pressure surface facing said channel for sliding contact with the outer side of the waveguide; and

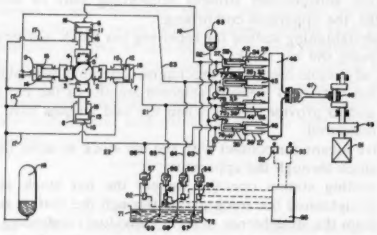
means connecting said forming die and forming block for relative rotation about said forming die axis with said pressure surface of the block in sliding contact with the outer side of the waveguide and in a manner such that the relative rotation of said block with respect to said die occurs in a direction away from said stop and along said waveguide from an initial position adjacent said stop for bending the waveguide about said forming surface.

3,916,667

FORGING MACHINES

Hans Joachim Paknke, Lantzallee 27, 4 Duesseldorf, and Rudolf Guse, Portweinmannweg 8, 403 Ratingen, both of Germany

Filed Feb. 8, 1974, Ser. No. 440,765
Claims priority, application Germany, Feb. 10, 1973, 2306566
Int. Cl.[2] B21J 9/12
U.S. Cl. 72—402 1 Claim



1. A forging machine comprising a plurality of double-acting piston and cylinder ram units arranged for multidirectional lateral forging of an elongate workpiece disposed therebetween, a plurality of fluid pressure transmitting piston and cylinder unit being connected by a connection line to a corresponding double acting piston and cylinder ram unit, a drive mechanism mechanically connected to the pistons of said fluid pressure transmitting piston and cylinder units for reciprocation of said pistons in unison, the improvement consisting in that

a. each piston of the fluid pressure transmitting piston and cylinder units is a two-stage piston cooperating with two pressure chambers,

b. each connection line is directly connected to one of the two pressure chambers and by a branch line to the other pressure chamber of the associated two-stage piston whereby a pressure chamber pair is arranged in parallel to the associated ram unit, and

c. a switching valve is disposed in each branch line to inactivate said other pressure chamber of each pair of pressure chambers by connecting said branch line to a pressure reservoir.

3,916,668
SLIDING AND LOCKING THE FORGING TOOLS ON A FORGING PRESS

Heinz Schmoll, Huckeswagen, and Dieter Jenke, Gruiten, both of Germany, assignors to Schloemann Aktiengesellschaft, Dusseldorf, Germany

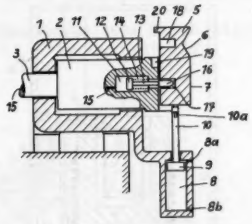
Filed May 29, 1973, Ser. No. 364,241

Claims priority, application Germany, May 26, 1972, 2225528

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² B21J *13/00*

U.S. Cl. 72—407 **7 Claims**



1. In a forging press having a press frame, forging piston-cylinder units each having a fixed part mounted on the press frame and a movable part for effecting forging strokes, retraction means for retracting said movable parts, said retraction means comprising constant-pressure retraction ducts for applying hydraulic fluid for retracting said movable part, a forging tool mounted on said movable part, said forging tool defining a plurality of forging zones, the provision of a forging tool moving and locking arrangement comprising means on each said forging tool and said movable part for permitting movement of said forging tool relative to said movable part, in order to position each forging zone in a selected working position, and hydraulic means for locking said forging tools in their respective working positions, said hydraulic means comprising for each said forging zone, at least one engagement member for engaging said forging tool and locking said forging tool, a single-acting locking piston-cylinder unit mechanically connected to said engagement member for actuating said engagement member to engage and lock said forging tool, hydraulic duct means connecting said locking piston-cylinder unit to a constant-pressure retraction duct, and spring means for retracting said engagement member when said locking piston-cylinder unit is not subjected to hydraulic pressure.

3,916,669
PROFILE, SUCH AS THE LIFT FORK OF A LIFTING DEVICE, AND METHOD OF MANUFACTURING SAME

Ernst Schmidt, Sven Lennart Ingestad, and Sven Ewert Lindell, Mjolby, Sweden, assignors to AB Bygg- och Transportekonomi (BT), S 161 11 Bromma, Sweden.

Filed June 18, 1974, Ser. No. 480,515

Claims priority, application Sweden, June 21, 1973, 73088155

Int. Cl.² B21D *53/00*

U.S. Cl. 72—379 **9 Claims**

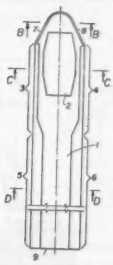
1. Method for manufacturing profiles, such as steel profiles for the lift forks of lifting devices, from a sheet or plate-like starting material comprising:

(a) bending at least a first peripheral edge portion of the starting material to an obtuse angle, said first peripheral edge portion being at one end of the intended profile;

(b) bending further said first peripheral edge portion of the material to an acute angle;

(c) bending at least a second peripheral edge portion of the starting material to approximately a right angle, said second peripheral edge portion being farther away from said one end of the intended profile;

(d) bending still further said twice bent first peripheral edge portion of the material fully in towards the underlying starting material; and then



(e) bending more of the starting material around at least a further portion of the periphery of the profile, and further bending the starting material portions adjacent said previously bent first and second portions to approximately a right angle, to form a mainly right angled edge around at least substantially the whole periphery of said profile.

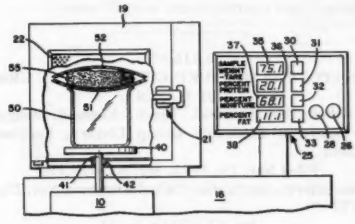
3,916,670
ANALYSIS OF COMMINUTED MEAT PRODUCTS

Kenneth E. Davis, and William M. Watson, both of Troy, Ohio, assignors to Hobart Corporation, Troy, Ohio

Filed Oct. 18, 1973, Ser. No. 407,608

Int. Cl.² G01N *5/04, 25/00*

U.S. Cl. 73—15 B **13 Claims**



1. A method for controlling the duration of dielectric heating energy applied to a sample of food material containing components which are heat releasable in both vapor and liquid form to obtain uniform repeatable processing of said sample, said method comprising the steps of:

locating said sample on the platform of a weighing scale during the application of heating energy,

collecting the components rendered as liquid separately from the sample,

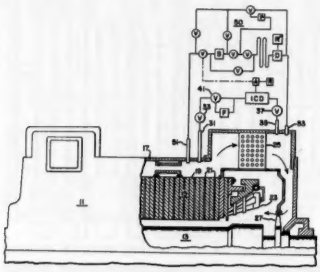
monitoring the weight of said sample during the application of heating energy at least from the time said sample begins to lose weight, due to release of vaporized components,

terminating the application of heating energy to said sample when the rate of change of weight of said sample decreases to a predetermined percentage per unit time of the original weight thereof.

3,916,671
GAS CHROMATOGRAPHIC ANALYSIS OF PYROLYSIS PRODUCTS

Chester C. Carson, Ballston Spa; Sterling C. Barton, and Federico S. Echeverria, both of Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 8, 1974, Ser. No. 458,832
Int. Cl.² G01N *31/08*
U.S. Cl. 73—23.1 **6 Claims**



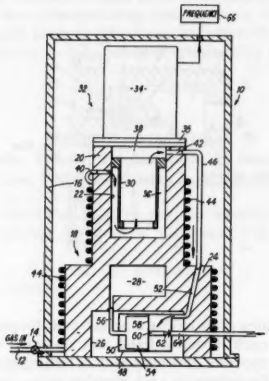
1. In combination with a gas-cooled dynamoelectric machine, an apparatus for sampling and analyzing thermal decomposition products which may be given off into the gas coolant due to localized overheating of dynamoelectric machine parts, said dynamoelectric machine including a high-pressure tap and a low-pressure tap; and, said apparatus connected between said high-pressure tap and said low-pressure tap further comprising:
a gas chromatographic column interconnecting said high-pressure tap and said low-pressure tap;
a sampler device on the upstream side of said column;
a detector on the downstream side of said column; and,
means selectively supplying machine gas coolant through said sampler device in the sampling mode and carrier gas through said sampler in the analysis mode.

3,916,672
APPARATUS FOR MEASURING THE SPECIFIC GRAVITY OF GASES

James Wolryche Stansfeld, Beech, England, assignor to The Solartron Electronic Group Limited, Farnborough, England

Filed Nov. 19, 1973, Ser. No. 417,176
Claims priority, application United Kingdom, Nov. 27, 1972, 54802/72
Int. Cl.² G01N *31/00*
U.S. Cl. 73—30 **4 Claims**

1. An apparatus for measuring the specific gravity of a gas, comprising:
a heat sink member having means defining a recess and having a substantially fixed-volume reservoir for containing a fixed mass of a reference gas said recess and said reservoir each being disposed inside said heat sink member;
inlet conduit means for receiving the gas whose density is to be measured and for conducting it into said recess, and outlet conduit means for conducting said gas out of said recess, said inlet conduit means comprising an elongated conduit wound around and in intimate contact with said heat sink member,
said conduit passing through said heat sink member;
said inlet conduit means, said recess and said reservoir all being in intimate thermal contact with said heat sink member so as to tend to maintain the gas in said recess at substantially the same temperature as the reference gas in the reservoir;
pressure control means responsive to any difference between the pressure of the reference gas and the pressure of the gas in said recess for reducing said difference to tend to equalize said pressures,
said pressure control means comprising an outlet valve arranged to control the venting of the gas from said outlet conduit means, and a movable diaphragm connected to operate said valve, opposite sides of said diaphragm being subjected to the respective pressures of the reference gas and the gas in said outlet conduit means and hence in said recess; and

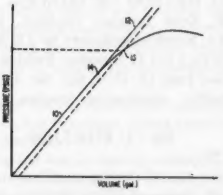


a density sensitive device disposed in said recess and adapted to produce an output signal representative of the density of the gas flowing through said recess, whereby the density represented by said output signal is proportional to the specific gravity to be measured,
said density sensitive device comprising a vibratable member arranged to be exposed to the gas in said recess, means for exciting the member to vibrate at its natural frequency, and means for producing an output signal representative of said frequency.

3,916,673
SYSTEM FOR NONDESTRUCTIVELY TESTING VESSELS

Edward W. Gass, and Robert J. Guest, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Continuation of Ser. No. 55,481, July 16, 1970, abandoned. This application May 19, 1972, Ser. No. 254,997
Int. Cl.² G01M *5/00*
U.S. Cl. 73—37 **31 Claims**



1. A system for testing a closed vessel which deforms elastically until an elastic limit is reached and deforms plastically thereafter, said system comprising:
conduit means for introducing a fluid into the vessel,
flow monitoring means for generating a first electrical signal related to the volume of fluid introduced into the vessel;

transducer means for generating a second electrical signal related to the pressure of the fluid within the vessel;

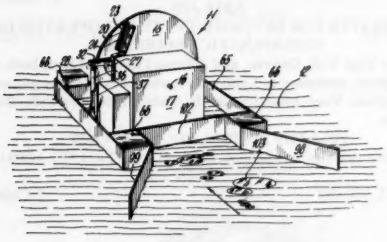
deformation computing means responsive to said first electrical signal and to said second electrical signal for generating a third electrical signal representative of the amount of plastic deformation of the vessel; and,

ratio computing means responsive to said first electrical signal and to said second electrical signal for generating a fourth electrical signal representative of the rate of change in fluid pressure with respect to the volume of fluid in the vessel.

3,916,674
OIL-SPILL DETECTION SYSTEM

Gordon H. Miller, Richmond, and Edward O. Renick, Jr., Sandston, both of Va., assignors to Texaco Inc., New York, N.Y.

Filed Feb. 22, 1974, Ser. No. 444,934
Int. Cl.² G01N 27/22
U.S. Cl. 73—61.1 R **8 Claims**



1. System for detecting oil spills on a body of water, comprising in combination

a rotatable thin disc,

means for rotating said thin disc about its axis in order to lift oil from the surface of said body of water by adherence to the flat surface of said disc,

buoyant means for supporting said disc partially submerged in said body of water and having the flat face of the disc transverse to the direction of movement of surface liquid,

scraper means cooperating with said flat surface of said disc above said body of water for removing adherents including said oil,

means for detecting the presence of oil in said removed adherents, and

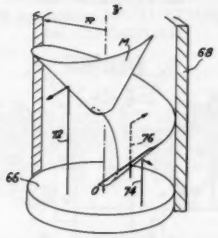
divergent means for directing movement of surface water of said body to the location of said disc.

3,916,675
DEFLECTOR FOR CONVERTING A BEAM OF PARALLEL RAYS INTO A BEAM OF RAYS HAVING CONSTANT INCIDENCE ON CYLINDRICAL PART

Jean Perdijon, St-Ismier, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Dec. 23, 1974, Ser. No. 535,703
Claims priority, application France, Dec. 26, 1973, 73.46384
Int. Cl.² G01N 29/04
U.S. Cl. 73—67.8 R **10 Claims**

5. A deflector for converting a beam F of rays parallel to the generating-lines of a cylindrical part C having a circular directrix of radius R into a beam F' of rays impinging upon the surface of said part at a constant angle of incidence i so as to generate therein refracted waves in which the sections of the associated wave surfaces along the surface of said part are at right angles to a family of circular helices formed on said surface having a pitch $2\pi R \tan \beta$, the angle β being the angle between the tangents to the helix and the plane at right angles to the generating-lines of the part C, wherein the surface of the deflector is a portion of the surface which has the equation expressed in polar coordinates (ρ, θ) of axis Oz, z cotan $\alpha = \sqrt{\rho^2 - R^2 \sin j} + R \sin j\theta$, the angles α and j being related to the angles i and β by the relations tan j = tan i cos β and cos 2α = sin i sin β.

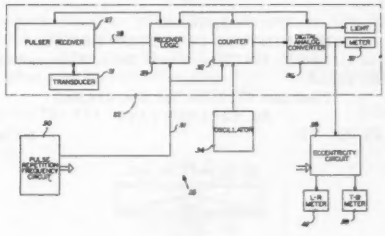


8. An application of the deflector according to claim 5 to the detection of flaws in a cylindrical part C by excitation of Lamb waves in said part of small thickness, wherein the deflector is associated with a flat transducer which emits ultrasonic rays parallel to the generating-lines of the part to be inspected and performs the function of an emitter-receiver.

3,916,676
METHOD OF AND APPARATUS FOR MEASURING AUTOMATICALLY SUCCESSIVE SECTIONS OF AN ELONGATED MATERIAL

Luther Miles Boggs; Howard John Flichman; James Alphus Hudson, Jr., all of Atlanta, and Johnny William Levengood, Tucker, all of Ga., assignors to Western Electric Company, Incorporated, New York, N.Y.

Filed July 5, 1972, Ser. No. 268,973
Int. Cl.² G01N 29/04
U.S. Cl. 73—67.8 S **16 Claims**



2. A method of measuring automatically ultrasonically an elongated material, which includes the steps of:

advancing an elongated material;

transmitting an ultrasonic pulse into the material and then receiving a first echo pulse reflected from one surface of the material and then receiving an associated second echo pulse from an opposite surface of the material;

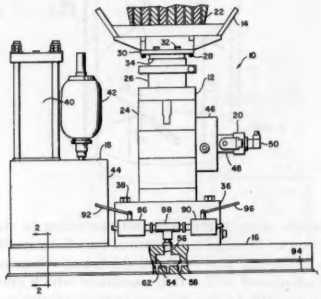
developing an on signal and an off signal upon the receipt of associated first and second echo pulses each having predetermined distinguishable characteristics which include amplitude and duration, with the time duration between the on signal and the off signal being related to the elapsed time between the receipt of the first echo pulse from the one surface of the material and the receipt of the associated second echo pulse from the opposite surface of the material; and

converting the measured elapsed time into a signal, the magnitude of which is proportional to a parameter of the elongated material which is to be measured.

3,916,677
PORTABLE LOAD SUPPORTING PLATFORM

Loren D. Isley, and Richard E. Sipfle, both of Birmingham, Mich., assignors to Koehring Company, Milwaukee, Wis.

Filed Aug. 6, 1973, Ser. No. 385,745
Int. Cl.[2] G01M 7/00
U.S. Cl. 73—71.7 6 Claims

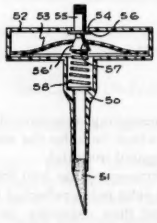


1. A universally movable platform for vibration testing of a vehicle comprising a platform base adapted to engage a surface to provide support for the movable platform and movable in any direction in the plane of the surface, means secured to said platform base for supporting at least a part of a vehicle, means connected to the supporting means for vibrating the supporting means, and air pressure control means operably connected to said platform for selectively directing pressurized air between the platform base and surface for facilitating movement of the platform in any direction in the plane of the surface to different positions on the surface, which air pressure control means includes means operably connected to said platform for selectively drawing a vacuum between the platform base and surface to lock the platform base to the surface.

3,916,678
SOIL MOISTURE DETECTION DEVICE

Warren G. Lohoff, 1947 Havenwood Drive, Thousand Oaks, Calif. 91360

Filed Jan. 21, 1974, Ser. No. 434,865
Int. Cl.[2] G01N 33/18
U.S. Cl. 73—73 6 Claims

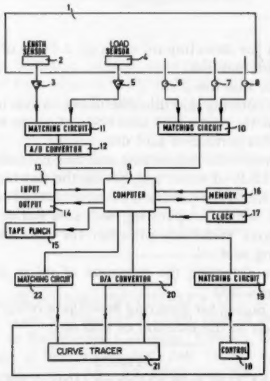


1. A soil moisture condition detector comprising:
a hollow, rigid probe having opposite ends;
a porous moisture sensing device carried on one end of said probe so as to close the end thereof and placed within and in contact with and near the upper root zone regions of the soil planting medium;
said sensing device composed of a non-organic, capillary type material having a plurality of pores of predetermined diameter whereby said device acts as an air valve to restrict air movement from said medium through said porous device when the planting medium in contact therewith has reached a predetermined high moisture condition wherein the moisture within said planting medium has closed said pores and to permit the passage of air from said medium through said porous device when the planting medium has reached a predetermined low moisture condition; and
indication means operably carried on the other end of said probe for displaying an indication of the soil moisture condition in response to the condition of said sensing device;
a housing carried on the other end of said probe;
said housing having a central opening coaxially disposed with respect to said probe;
a check valve movably mounted at said other end of said probe;
said check valve comprising a spring and diaghragm, whereby a pressure differential is maintained or released between said sensing device and said indication means in response to said sensing device.

3,916,679
APPARATUS FOR DETERMINING THE PROPERTIES OF SUPERPLASTIC MATERIALS

Hubert Paul Voll, Ougree, and Albano Piccinin, Liege, both of Belgium, assignors to Centre de Recherches Metallurgiques-Centrum Voor Research in de Metallurgie, Brussels, Belgium

Filed May 21, 1974, Ser. No. 471,920
Claims priority, application Belgium, May 24, 1973, 800014
Int. Cl.[2] G01N 3/32
U.S. Cl. 73—95 1 Claim



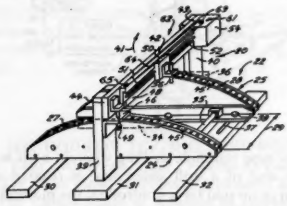
1. A method of determining for a superplastic material, the coefficients m and K in the equation $\sigma = K.\epsilon^m$, where σ is the stress on a test-piece of the material subjected to a rate of strain ϵ, the method comprising the steps of
a. subjecting a test-piece of the superplastic material to a tensile test by means of a tensile testing machine;
b. operating the tensile testing machine at a given traction speed V_1;
c. continually measuring the length, ρ, of the gauge portion of the test piece;
d. continually measuring the force F to which the test-piece is subjected;
e. calculating the load $P = F/S_o$, where S_o is the initial cross-sectional area of the test-piece;
f. comparing each value of P with the highest preceding value, and recording P when it ceases to rise this value, $P_{max.1}$, thus being a maximum;

g. calculating the rational stress $\sigma_{max,1}$ corresponding to $P_{max.\ 1}$,
h. calculating the rational strain rate $\Gamma_1 = V_1/\sigma$ corresponding to $\sigma_{max,1}$;
i. changing the traction speed to Vi;
j. repeating steps (c) to (i) to obtain pairs of values $\sigma_{max,i}$ and ϵ_i;
k. plotting log $\sigma_{max,i}$ against log ϵ_i and fitting the straight line log $\sigma_{max,i} = \log K + m \log \epsilon_i$; and
l. determining log K and m from the straight line.

3,916,680
ROLL TENSION MONITOR FOR SAW BLADE

Francis Edwin Allen, North Vancouver, and Andrew Wilkinson Porter, Vancouver, both of Canada, assignors to Letson and Burpee Ltd., Vancouver, Canada

Filed May 28, 1974, Ser. No. 473,387
Claims priority, application United Kingdom, May 31, 1973, 25944/73
Int. Cl.² G01N 3/20
U.S. Cl. 73—100 **10 Claims**



1. A device for indicating roll tension distribution in a saw blade the saw blade having: a longitudinal central axis extending along face of the saw, a cutting edge at a front edge thereof, a central portion straddling the central axis, and a back edge; metal in the central portion having been expanded to produce a residual tensile stress at each edge of the saw and a residual compressive stress at the central potion of the saw; the device including:
i. forming means for holding a selected length of the saw in which roll tension is to be assessed, the length being deformed into a longitudinal curve of known geometry, roll tension in the saw causing the selected length of the saw to be bowed transversely across the width thereof so that the surface of the saw has a bowed profile, the forming means having a face datum and an edge datum, the selected length of the saw being located relative to the data,
ii. sensing means adapted to cooperate with the face of the saw to detect, at a position on the selected length, the spacing of the face of the saw relative to the face datum and the edge datum,
iii. visual display means cooperating with the sensing means to provide a visual display of saw profile at a position on the selected length of the saw,
so that distribution of residual stress in the saw can be assessed from the visual display.

3,916,681
TENSILE TESTING APPARATUS

George E. Ryckman, East Liverpool, Ohio, and Walter J. Budd, Waterbury, Conn., assignors to Uniroyal, Inc., New York, N.Y.

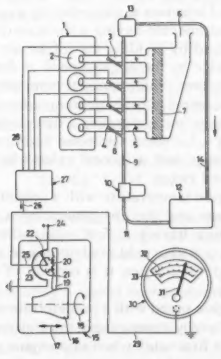
Division of Ser. No. 213,265, Dec. 29, 1971, Pat. No. 3,803,907. This application Jan. 21, 1974, Ser. No. 435,002
Int. Cl.² G01N 3/08
U.S. Cl. 73—103 **4 Claims**

1. A gripping device for gripping the respective ends of a sample to be tested for tensile strength, comprising a stationary jaw and a movable jaw positioned for gripping engagement with the opposite ends of the sample, each of said jaws including a lower fixed part defining a fixed jaw member over which the respective end of the sample is placed and an upper movable part defining a movable jaw member for engaging the respective end of the sample from above, said upper movable part being a lever pivotally mounted on said lower fixed part, fluid pressure operated piston and cylinder means connected to the associated lever to one side of the pivot location thereof for moving that lever so as to displace the respective movable jaw member toward and away from the associated fixed jaw member, and means for conducting pressurized air into the space between each movable jaw member and the associated fixed jaw member for separating the sample from the faces of said jaw members when the same are moved apart.

3,916,682
INSTRUMENT FOR INDICATING THE KILOMETRIC FUEL CONSUMPTION OF A MOTOR VEHICLE PROVIDED WITH AN INJECTION FEED EXPLOSION ENGINE

Giampaolo Garcea, Milan, Italy, assignor to Alfa Romeo S.p.A., Milan, Italy

Filed Sept. 18, 1973, Ser. No. 398,561
Claims priority, application Italy, Sept. 19, 1972, 29408/72
Int. Cl.² G01F 9/00
U.S. Cl. 73—114 **3 Claims**



1. A device for indicating the kilometric fuel consumption of a motor vehicle with an internal combustion engine having an injection fuel feed system, comprising in combination, regulation means sensitive to the power supplied by the engine

and delivering an electric signal proportional to the quantity of fuel fed at each engine cycle, indicating means operatively connected to said regulation means for providing an indication of the kilometric fuel consumption of the motor vehicle, said indicating means having at least one indicating scale graduated in quantities of fuel delivered for a predetermined distance traveled by said vehicle when a predetermined gear is engaged, said regulation means comprising a three-dimensional cam, a follower engaging the cam surface, and a mechanical-electrical transducer of potentiometric type supplied with direct current and operatively connected to the follower, said cam being axially and angularly displaceable as a function of two engine operating parameters, the lifts of said cam representing the fuel requirements of the engine in the different operating conditions, the voltage across said potentiometric transducer being proportional to the quantity of fuel fed at each engine cycle and actuating the indicating means to supply the indications of the motor vehicle kilometric fuel consumption on the indicating scale relating to the engaged gear.

3,916,683

METHOD AND APPARATUS FOR TESTING THE ACCURACY OF INTAKE AIR MEASUREMENT OF A MOTOR FUEL INJECTION SYSTEM

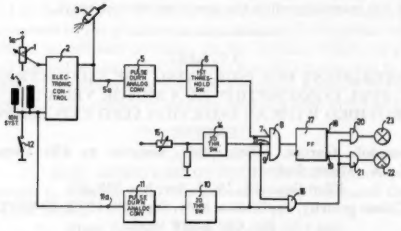
Gunter Felger, Hofingen; Werner Breckel, Wendlingen, and Dieter Eichler, Hochberg, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Oct. 10, 1974, Ser. No. 513,543

Claims priority, application Germany, Oct. 19, 1973, 2352494

Int. Cl.[2] G01M *15/00*

U.S. Cl. 73—119 A **7 Claims**



1. A method of testing the accuracy of a device that measures the intake air of an internal combustion engine in which the amount of fuel injection is controlled by generating a pulse signal for the fuel injector having a duration proportional to the quotient formed by dividing the intake air quantity measured by said device by the engine speed as derived from the engine ignition system, which method comprises the steps of:

comparing the duration of fuel injection control pulses with a standard value range and generating a first circuit logic condition having a first value when said pulse duration is within said predetermined range and a second value when it is outside said predetermined range;

comparing engine temperature with a predetermined range of temperature and thereby generating a second circuit logic condition having a first value when said engine temperature is within said predetermined range and having a second value when it is outside of said predetermined range;

comparing engine speed with a predetermined engine speed range and thereby generating a third circuit logic condition having a first value when said engine speed is within said predetermined range and a second value when it is outside said predetermined range;

generating a combinational logic condition having a first value when said second and third circuit logic conditions both have their first values, said second combinational logic condition having a second value in all other cases, operating one and only one of a pair of indicators whenever said combinational logic condition has its first value, a first indicator of said pair being operated when said first circuit logic condition has its first value and the second indicator of said pair being operated when said first circuit logic condition has its second value, and neither of them being operated when said combinational logic condition has its second value.

3,916,684

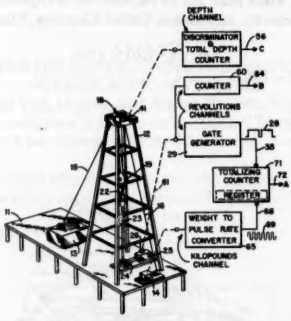
METHOD AND APPARATUS FOR DEVELOPING A SURFACE WELL-DRILLING LOG

Herbert A. Rundell, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 296,423, Oct. 10, 1972, abandoned. This application May 31, 1974, Ser. No. 474,994

Int. Cl.[2] E21B *49/00*

U.S. Cl. 73—151.5 **16 Claims**



1. In rotary-type borehole drilling wherein a bit is attached to the lower end of a drill string that is rotated while the downward force on said bit is controlled, the method of developing a surface drilling log which comprises the steps of

measuring the revolutions of said bit,

measuring the depth of said bit in the borehole,

measuring the weight on said bit,

determining the tooth dullness of said bit, and

determining a characteristic of the formation being drilled by combining said measurements and said tooth-dullness determination.

3,916,685

WELL LOGGING SYSTEM AND METHOD USING AN ARMORED COAXIAL CABLE AND COMPENSATION CIRCUIT

Hans J. Paap, and Robert W. Pitts, Jr., both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

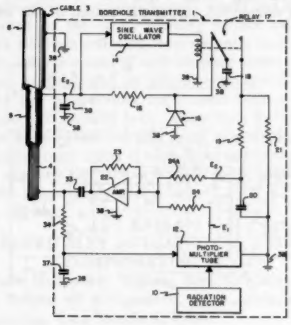
Continuation-in-part of Ser. No. 82,028, Oct. 19, 1970, abandoned. This application Oct. 27, 1971, Ser. No. 192,883

Int. Cl. E21b *47/12*

U.S. Cl. 73—152 **11 Claims**

1. A well logging system for providing an output corresponding to a condition sensed in a borehole, comprising a logging instrument including means for providing a signal representative of said condition sensed in the borehole and means for providing a reference signal; a transmission system comprising an armored coaxial cable connected between said logging instrument and surface electronics adjacent the borehole, said cable comprising an inner coaxial conductor, an outer coaxial conductor separated from said inner conductor by a coaxial first insulator, and an outer armor of conductive material separated from said outer conductor by a coaxial second insulator, said logging instrument further includes means for applying said condition signal and said reference signal to one end of said transmission system; said surface electronics comprising receiving means coupled to the other end of said transmission system for receiving said signals over

armored coaxial cable from the signal applying means, compensating means connected to the receiving means for adjusting said signals from the receiving means to compensate for deterioration of said signals to provide compensated signals



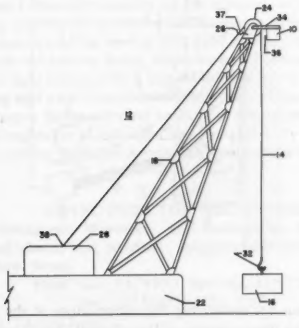
and means connected to the compensating means for providing the output corresponding to said sensed condition in accordance with the compensated signals from the compensating means.

3,916,686

METHOD FOR TESTING WIRE ROPE

Gerald W. Lear, San Diego, Calif.; Harold E. Lockwood, Seabrook, Tex., and Floyd E. Pointer, Holcomb, Kans., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Oct. 24, 1974, Ser. No. 517,662
Int. Cl.[2] G01L *5/04*
U.S. Cl. 73—158 **10 Claims**



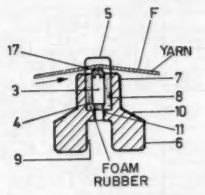
1. A method of nondestructively determining quality of a wire rope comprising performing a predetermined quantity of work with said rope under predetermined conditions, obtaining an indicia of the increase in heat content of said rope resulting from said work and correlating said increase with quality of said rope.

3,916,687

APPARATUS FOR MONITORING YARN-LIKE STRUCTURES

Erich Loepfe, Zollikerberg, and Rene Domig, Kusnacht, both of Switzerland, assignors to Gebruder Loepfe AG, Wetzikon, Switzerland

Filed Nov. 2, 1973, Ser. No. 412,202
Claims priority, application Switzerland, Nov. 21, 1972, 016914/72
Int. Cl.[2] D03D *51/28;* **G01L** *5/10*
U.S. Cl. 73—160 **11 Claims**



1. A scanning head for monitoring the travel of yarn-like structures, especially for controlling the travel of a running yarn at a textile machine, comprising rigid support means, at least one scanning insert means arranged for oscillation in a resonant mode when in contact with and excited by the traveling yarn, elastic means arranged between the rigid support means and said at least one scanning insert means, said rigid support means comprising a substantially elongate support provided with a channel having walls, said channel receiving said at least one scanning insert means and having two end plates for closing the ends of said channel, said scanning insert means comprising a scanning element having a substantially plate-shaped base body having substantially flat surfaces arranged in parallel relationship to said walls, a plate-shaped transducer having substantially flat surfaces and output means for transmitting the output of the transducer, said transducer and said base body being fixedly connected with one another at one of their plane surfaces in direct oscillation conducting manner, said scanning insert means further comprising an elongated contact body extending along and fixedly connected with one edge of the base body and exposed to the yarn traveling in a direction substantially perpendicular to said elongated contact body, said elastic means being arranged adjacent the walls of said channel and contacting the base body at said flat surfaces thereof.

3,916,688

VTOL CRAFT DECELERATION CONTROL SYSTEM

John C. Dendy, Phoenix, and Ronald J. Miller, Glendale, both of Ariz., assignors to Sperry Rand Corporation, New York, N.Y.

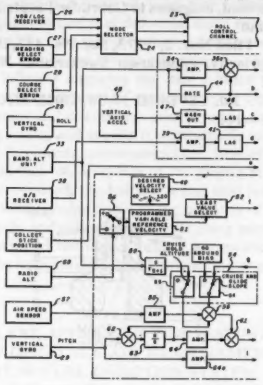
Filed Feb. 28, 1972, Ser. No. 229,928
Int. Cl.[2] G01C *21/10*
U.S. Cl. 73—178 T **19 Claims**

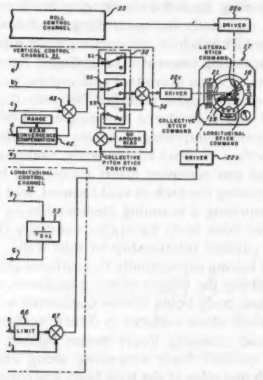
1. In an apparatus by means of which the flight of a V/STOL type craft may be controlled along a descent path to a hover or landing termination point, including a flight director device comprising

means for providing a signal representative of actual craft velocity,

means for providing a desired velocity signal variable in accordance with a predetermined velocity program from an initial value, selectable from a range of values representative of velocities at which the craft may be made to fly at a range greater than a predetermined range from the termination point, to a final value representative of a predetermined lower velocity to be attained substantially at said termination point,

means responsive to the actual velocity and programmed desired velocity signals for producing an output indicative of craft attitude required to reduce the actual velocity of the craft in accordance with said velocity program,





means for providing a signal indicative of a predetermined range to the termination point, and

means responsive to the range indicative signal for initiating said velocity program.

3,916,689
CAPACITANCE FUEL TANK GAUGE

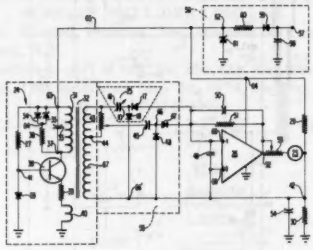
Joseph E. Donnelly, St. George, Vt., assignor to Simmonds Precision Products, Inc., Tarrytown, N.Y.

Filed June 25, 1973, Ser. No. 373,363

Int. Cl.[2] G01F *23/26*

U.S. Cl. 73—304 C **6 Claims**

1. An electrical measuring circuit for capacitance fuel gauge measuring systems independent of input power variations comprising, in combination: an amplitude and frequency stable signal source means associated with a capacitance-type liquid tank probe means for immersion into non-gaseous fluids, said frequency stable signal source means being arranged to excite the capacitance tank probe, said liquid tank probe means further including rectifying means connected to said liquid tank probe means to convert the output of said liquid tank probe means to DC; first balancing means to balance out frequency and amplitude variations on empty system indication; D.C. amplifier means connected between said rectifying means and a DC display means, said DC amplifying means being connected as an integrator means, the output of said amplifier means being displayed on said display means; and second balancing means associated with said tank probe for setting maximum reading on said display means, wherein said first balancing means is a bridge circuit which includes said tank probe and said rectifying means, and further includes a potentiometer, the tap of which is connected to form a series circuit with additional rectifying means and a capacitor said series circuit connected in parallel with the tank capacitance which are connected across the opposite points on said bridge circuit, the balancing voltage being derived from said potentiometer being connected across the output of the amplitude



and frequency stable excitation source, and further including a voltage dividing means and wherein said DC amplifier means connected between said rectifying means and said display means has its operating point referenced to the negative side of said display means which is also referenced to the mid point of said voltage dividing means which is connected to the power supply, said referencing rendering the output of said amplifying means displayed on said display means insensitive to supply voltage variations.

3,916,690
APPARATUS FOR MEASURING SURFACE TEMPERATURES BY INFRARED RADIATION THEREFROM

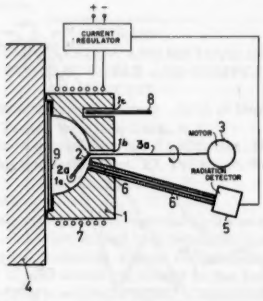
Gerold Brandli, Windisch, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed July 19, 1973, Ser. No. 380,572

Claims priority, application Switzerland, July 27, 1972, 11176/72

Int. Cl.[2] G01J *5/08, 5/52, 5/62*

U.S. Cl. 73—355 EM **6 Claims**



1. Apparatus for measuring the temperature at the surface of an object by measurement of the infrared radiation emitted from the surface which comprises a compensating radiator in the form of a thermally conductive metallic body having a radiation cavity in one side thereof facing towards the surface of the object to be measured, means for heating said metallic body, a rotatable chopper wheel located within said radiation cavity and which is interposed between the surface of the object and the surface forming the radiation cavity in said metallic body, the side of said chopper wheel facing towards said cavity forming surface being radiation reflective and said

chopper wheel being carried by a shaft extending outwardly through a bore in said metallic body and which is connected to a driving motor, an infrared radiation detector positioned outside of said metallic body and which receives in alternation by way of a second bore leading outwardly through said metallic body from said radiation cavity the infrared radiation emitted from the surface of the object and which passes intermittently through said rotating chopper wheel and infrared radiation emitted by the cavity forming surface of said metallic body and which is reflected intermittently into said detector from the reflective side of said chopper wheel, said detector producing at its output an alternating current signal determined by any temperature differential existing between the object and said metallic body, and means for controlling the supply of heat to said metallic body in accordance with said alternating current signal in such sense as to reduce said signal to zero whereby the temperature of said metallic body then equals the temperature of the object.

3,916,691
ELECTRICALLY ACTUATED COLD JUNCTION COMPENSATING DEVICE

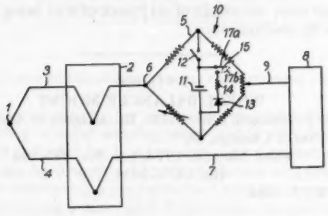
Betty Ruth Hollander; William Earl McKinley, and George Davis Paight, all of Stamford, Conn., assignors to Omega Engineering, Inc., Stamford, Conn.

Filed Mar. 19, 1974, Ser. No. 452,498

Claims priority, application United Kingdom, Mar. 26, 1973, 14323/73

Int. Cl.² G01K 7/12; G08B 21/00

U.S. Cl. 73—361 **3 Claims**



1. A sealed totally encapsulated, potted electronic device comprising an at least partially light-transmitting sealed housing, an electrically-operable light source disposed in said housing and positioned therein such that its illumination may be viewed from the exterior of the housing, a battery in said housing, and a pair of conductors emerging from said housing to the exterior of the device, said light source and said battery and said conductors being disposed in a current-feed circuit for said light source which can be completed by conductively bridging said pair of conductors externally of the housing, said light source being selected such that it may be illuminated, upon completion of its current-feed circuit, only so long as the battery power available is not less than a critical level.

3,916,692
NOVEL INJECTOR MECHANISM

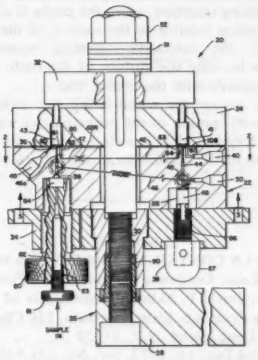
Louis Abrahams, Worcester, and Burleigh M. Hutchins, Jr., Framingham, both of Mass., assignors to Waters Associates, Milford, Mass.

Filed Nov. 14, 1973, Ser. No. 415,727

Int. Cl.² G01N 1/28, 1/10

U.S. Cl. 73—422 GC **29 Claims**

1. In a complex valve apparatus of the type comprising a main inlet valve, a main outlet valve, a primary conduit between said main inlet and outlet valves, an auxiliary inlet port, a sample loop of fixed volume connecting said auxiliary inlet port with said main inlet valve, and valve means to divert at least a major part of flow from said primary conduit through said sample loop, valving means to vent said sample loop from said system the improvement wherein said sample loop communicates with both (1) said main outlet valve and (2) said auxiliary inlet port at a position immediately adjacent the inlet to said outlet valve, said sample loop forming means to receive a liquid sample in a direction from its terminal point adjacent



said outlet valve towards said vent means and wherein said means to divert sample loop also forms means to eject substantially all of sample liquid from the apparatus through said main outlet valve.

3,916,693
DEVICES FOR CARRYING OUT A MEASURING, SAMPLING, OR TREATING OPERATION UPON A BATH OF MOLTEN METAL

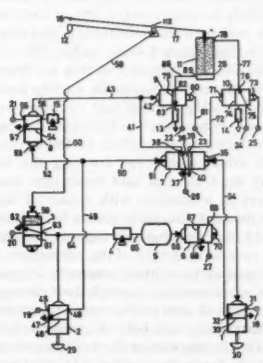
Jules Octave Hancart, and Philippe Alexandre Tyou, both of Liege, Belgium, assignors to Centre de Recherches Metallurgiques — Centrum Voor Research in de Metallurgie, Brussels, Belgium

Filed Nov. 16, 1973, Ser. No. 416,677

Claims priority, application Belgium, Nov. 16, 1972, 791495; Nov. 23, 1972, 791835

Int. Cl.² G01N 1/12

U.S. Cl. 73—423 R **10 Claims**



1. A device for carrying out a measuring, sampling, or treating operation upon a bath of molten metal in a receptacle, the device comprising:

a. a probe for performing a measuring, a sampling, or treating operation:

b. a carrier on which the probe is mounted;

c. a support structure on which the probe-carrier is movably mounted, movement of the probe-carrier allowing the

insertion of the probe into the receptacle and its withdrawal from the receptacle;

d. automatic means for inserting the probe into the receptacle by motion of the probe-carrier;

e. automatic means for arresting the motion of the probe-carrier, during insertion, when the probe is at a predetermined position relative to the surface of the bath in the receptacle, the automatic arresting means including means for locating the surface of the bath, arranged to move conjointly with the probe; and

f. automatic means for withdrawing the probe from the receptacle by motion of the probe-carrier when a predetermined length of time has elapsed since the arresting of the motion of the probe-carrier during insertion.

3,916,604

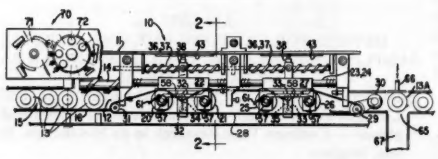
CONTINUOUS CONTAINER INSPECTION MACHINE

Theodore G. Loos, Oscawana Heights Road, Putman Valley, N.Y. 10579; David F. Sklar, deceased, late of Kent Cliffs, N.Y., and by Francis S. Stein, executrix, 120 Chestnut Road, Manhasset, Long Island, N.Y. 11030

Filed Dec. 14, 1973, Ser. No. 424,649

Int. Cl.[2] B07C 5/00

U.S. Cl. 73—432 R 5 Claims



1. In a continuous container inspection apparatus, the combination of means for conveying a line of containers through the apparatus in a forward direction, a plurality of pairs of rotatable inspecting heads having feelers thereon and positioned over the line of containers as they are being conveyed, each pair being spacedly mounted on a reciprocable carriage, means for reciprocating each of said carriages with said pairs of heads thereon with respect to each other, means for rotating the heads during reciprocation of the carriages with respect to each other, means for lowering the feelers of the heads to bring the feelers of said heads into testing position onto containers as a carriage with a pair of heads is being moved in the forward direction, means for raising the feelers of the heads of the other pair on the other carriage which is traveling in a reverse direction of the containers, the heads of a pair being spaced to contact alternate containers of the conveyed line of containers, a single belt drivingly engaging both heads to each of said pairs, means for driving said belt, means for maintaining said belt in driving relationship with said heads during reciprocation thereof to continuously rotate the heads, means for reciprocating said carriages relative to each other including a pair of lead screws for each carriage and a rockable lead screw engaging means, spring biased means for urging said lead screw engaging means into engagement with the other lead screw after moving along one lead screw a predetermined amount, and means on each pair of heads for simultaneously raising and lowering the feelers of that pair when the direction of reciprocating movement of said pair is reversed, said raising and lowering means comprising interconnected cams.

3,916,695

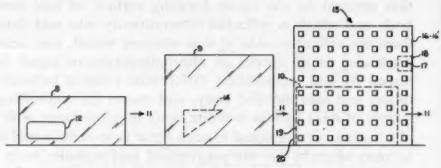
METHOD OF WEIGHING PIECES OF MAIL

George N. Branecky, Bethel, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed May 6, 1974, Ser. No. 466,971

Int. Cl.[2] G01G 13/00

U.S. Cl. 73—432 R 8 Claims



1. A method of determining the weight of a lettered piece of mail by making physical measurements of the letter, the method comprising the steps of:

a. making a plurality of thickness measurements at given spaced-apart locations substantially about an entire surface area of a letter, each of said spaced-apart thickness measurements corresponding to a thickness-unit area value for a segment of said letter;

b. summing the thickness measurements to provide a totalized thickness-area value for said letter; and

c. multiplying said totalized thickness-area value by a density co-efficient, said density coefficient corresponding to the weight of paper-like material per unit thickness and unit area, the weight of said piece of mail being a product of the multiplication.

3,916,696

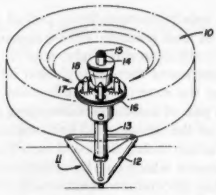
WHEEL BALANCER MOUNT

Wallace F. Mitchell, Libertyville, Ill., assignor to Ammco Tools Inc., North Chicago, Ill.

Filed May 31, 1974, Ser. No. 475,104

Int. Cl.[2] G01M 1/12

U.S. Cl. 73—484 4 Claims



1. Apparatus for mounting a wheel on a vertically disposed spindle of a bubble type wheel balancer, said wheel having a plurality of mounting holes symmetrically arranged around a central opening, the combination comprising

a wheel supporting member fixed to said spindle and having a planar upper surface lying perpendicular to the axis of said spindle,

a plurality of wheel support members each having a body portion, an enlarged pedestal and an upper end portion for partial reception in a respective one of said mounting holes,

said members being movably positioned on said planar upper surface,

a plate removably supported on said spindle above and in spaced parallel relationship with said upper planar surface;

said plate having therein a central hole and a plurality of symmetrically disposed slots for slidably receiving the body portions of said support members.

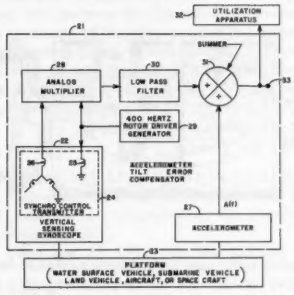
said slots being narrower than the width of said pedestals, and

a generally conical sleeve slidably disposed on said spindle for reception in said central opening in said wheel for locating said wheel in symmetrical relationship to said spindle.

3,916,697
ACCELEROMETER TILT ERROR COMPENSATOR

Bobby R. Ludlum, Panama City, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 15, 1974, Ser. No. 514,335
Int. Cl.² G01P *15/08, 15/14*
U.S. Cl. 73—504 **14 Claims**



1. A tilt error compensation system, comprising in combination:

gyroscope means, having a synchro control transmitter, including a rotor winding input and a stator winding output, adapted for being mounted on a predetermined platform for detecting the attitude thereof with respect to a first axis having a predetermined attitude in space and for producing a first signal at the output thereof that has a polarity and amplitude that is proportional to the deviation thereof therefrom;

means adapted for being mounted on said predetermined platform for detecting the acceleration thereof along a second axis and for producing a second signal proportional thereto;

analog multiplier means having a pair of inputs and an output, with one of the inputs thereof connected to the stator winding output of said gyroscope means;

means connected to the rotor winding input of said gyroscope means and the other input of said analog multiplier means for supplying a predetermined reference signal thereto;

means connected to the output of said analog multiplier means for filtering the output signal thereform; and

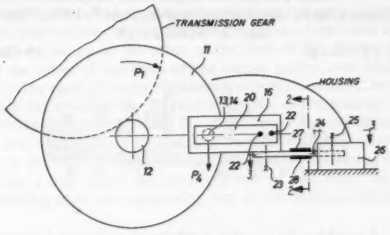
means connected to the outputs of said filtering means and the aforesaid platform acceleration detecting means for albebraically summing the output signals therefrom.

3,916,698
APPARATUS FOR MEASURING THE RPM OF A ROTATING SHAFT

Friedrich Mayer, Follstrasse 9D, 8900 Augsburg 21, Germany

Filed Mar. 14, 1974, Ser. No. 451,181
Claims priority, application Germany, Mar. 14, 1973, 2312718
Int. Cl.² G01P *3/34, 3/42*
U.S. Cl. 73—518 **13 Claims**

1. An apparatus for measuing the rpm of a rotating shaft comprising, in combination: a transmission gear train, driven by said shaft; a circular disc, disposed to be driven in rotation by said transmission gear, a surface of said disc having at least a given degree of roughness; at least one resiliently mounted sensing pin having a face of at least of a predetermined area, said face having at least a predetermined degree of roughness and being positioned opposite said surface of said disc in close

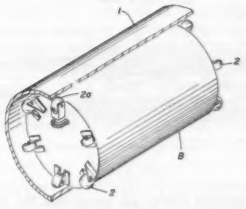


proximity thereto; and a strain gauge, associated with said sensing pin; whereby the circular disc when rotated by the rotatble shaft transports an air stream past the face of the sensing pin so as to displace the sensing pin, said strain gauge delivering electrical signals related to the displacement.

3,916,699
METHOD AND SYSTEM FOR VIBRATION TESTING OF OBJECTS

William P. Moran, and Robert E. Fearon, both of Tulsa, Okla., assignors to Resource Sciences, Corporation, Tulsa, Okla.

Continuation-in-part of Ser. No. 309,114, Nov. 24, 1972, abandoned, which is a continuation of Ser. No. 172,168, Aug. 16, 1971, abandoned. This application Nov. 13, 1973, Ser. No. 415,314
Int. Cl.² G01N *29/00*
U.S. Cl. 73—67.2 **35 Claims**



1. A system for inspecting a sound conducting body having at least one acoustic path, where the body has length normal to said path, comprising:

a carrier adapted for movement along the length of the body to be inspected in a direction normal to the acoustic path, means mounted upon said carrier for applying mechanical energy to said body along said path at a frequency to establish acoustic vibrations propagating in a direction along said path and evanescent vibrations in a direction normal to said path, said energy applied for a period substantially greater than the propagation period for said waves over the length of said path in the body to be inspected,

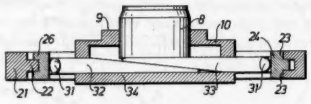
means mounted upon said carrier for detecting a vibration wave of said body, and

means responsive to said detecting means for producing a signal indicative of a flaw within the path region of said body.

3,916,700
MACHINE FOR TREATING WORKPIECES AT ELEVATED PRESSURES, ESPECIALLY A HIGH-PRESSURE PRESS

Rune G. Adolfsson, Boras, Sweden, assignor to AB Carbox, Ystad, Sweden

Filed Feb. 27, 1974, Ser. No. 446,278
Claims priority, application Sweden, June 7, 1973, 7308102
Int. Cl.[2] F16H *21/16*
U.S. Cl. 74—25 **10 Claims**

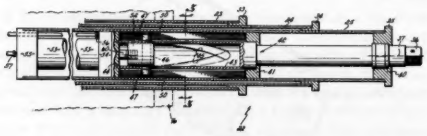


1. A machine for treating workpieces at elevated pressures, comprising:
   at least one stationary tool;
   at least one tool (**8**) which is movable in relation to said stationary tool;
   a power-driven high mass annular fly-wheel (**21**) having control means (**22, 23**) for actuating the at least one movable tool (**8**); and
   force-multiplying means comprising at least two wedges (**32, 33**) having mutually cooperative inclined surfaces coupling said control means to said movable tool and arranged such that said control means imparts a radial movement to said wedges relative to said fly-wheel to generate a force parallel to the rotational axis of the fly-wheel (**21**) and driving said movable tool (**8**).

3,916,701
ROTARY WRIST ACTUATOR FOR INDUSTRIAL ROBOTS

James R. Butler, Lima, Ohio, assignor to Automation Products, Inc., Elida, Ohio

Filed Apr. 17, 1973, Ser. No. 352,044
Int. Cl. F16h *25/12*
U.S. Cl. 74—57 **2 Claims**

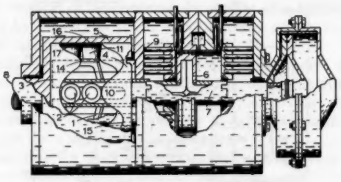


1. In an industrial robot, an apparatus for providing wrist rotation of a part gripper comprising, in combination:
   a telescoping boom assembly with at least one extendable boom member telescopically interfitting with a boom support;
   a power drive means for providing linear movement of a driven member, said driven member being reciprocatable between two positions, said power drive means being fixedly attached to the forwardmost extendable boom member with said driven member being disposed for movement substantially in the direction parallel to the longitudinal axis of said forwardmost boom member;
   a drive screw member rigidly connected to the part gripper and located within said forwardmost boom member comprising a cylindrical body portion having its longitudinal axis disposed substantially parallel to the axis of motion of said driven member, said drive screw member being mounted for rotary motion about its longitudinal axis, said drive screw member including two oppositely disposed helical grooves;
   a helical groove engaging member rigidly affixed to said driven member and engaging both said helical grooves to transmit power from said driven member to said drive screw member; and
   at least one longitudinal track extending in a longitudinal direction substantially parallel to the path of motion of said driven member, said helical groove engaging member also engaging said longitudinal track to thereby prevent rotation of said driven member as the driven member is reciprocated to impart wrist rotation to the part gripper.

3,916,702
DOUBLE ROLLER CAM DRIVES

Daniel E. Nelson, 4875 Sand Lake Rd., Orlando, Fla. 32809

Filed Nov. 19, 1973, Ser. No. 417,110
Int. Cl. F16h *25/12*
U.S. Cl. 74—57 **5 Claims**

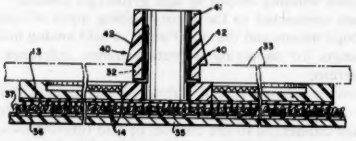


1. A double-roller cam drive having a counter-bevelled cam drive groove around the inside periphery of a drive shaft sleeve, drive teeth centrally attached to a power shaft and extended radially through channels in a transverse guide circumferentially positioned around the outside of the power shaft and extended selectively between the drive shaft and the drive cam races, double axle roller pins in tandem relationship on portions of the drive extended between the cam races, and rollers on the roller pins.

3,916,703
FASTENER

William A. Ribich, Lexington, and David B. Russell, Ashland, both of Mass., assignors to American Velcro, Inc., New York, N.Y.

Division of Ser. No. 112,353, Feb. 3, 1971, Pat. No. 3,851,357.
This application May 9, 1974, Ser. No. 468,502
Int. Cl.[2] A44G *17/00*
U.S. Cl. 24—73 P **6 Claims**



1. A fastening device adapted to be securely attached to a mounting plate defining an opening, said fastening device comprising:
   a. a fastening member including:
      1. a flexible base element; and
      2. a multiplicity of flexible resilient hooking elements projecting from one surface of the base element and adapted to be secured to a surface having complementary hooking elements by pressing opposed hooking elements and complementary hooking elements together in face-to-face relation; and
   b. at least one snap fastening member securely affixed to said fastening member and including:

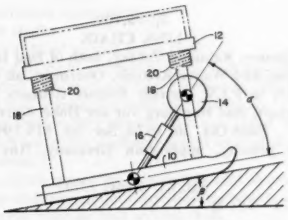
1. a flexible base member joined integrally to the other surface of said base element; and
2. holding means including (i) a tubular member mounted to the base member and extending from one surface thereof; and (ii) at least two spaced rigid gripping members mounted to said tubular member for resilient movement toward and away from each other upon flexing of at least a portion of said flexible base member out of its normal plane, said gripping members being adapted for snapping into locking engagement in the opening in the mounting plate to secure the snap fastener member in contiguous relation with the mounting plate, said holding means characterized by the property that applying peeling forces to separate the hooking elements from the complementary hooking elements will flex at least a portion of the base member and the fastening member out of their normal planes and increase the separation between the gripping members to thereby increase the gripping action of the holding means in said opening and further resist separation of the fastening member from the mounting plate to retain said base member in contiguous relation with the mounting plate.

3,916,704

VIBRATORY LOCOMOTION MEANS

Howard A. Gaberson, Oxnard, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 23, 1973, Ser. No. 353,282
Int. Cl.² F03G *3/00*
U.S. Cl. 74—84 R **22 Claims**



1. A vibratory locomotion system for a vehicle comprising: a payload;
means fur supporting said payload resting on the ground;
at least one weight having a predetermined mass attached to the payload and supporting means;
means for vibrating said weight with sinusoidal oscillations of predetermind frequency to produce a vibration in a direction nonparallel to the direction of travel of said payload; and
means for adjusting the angle at which the weight is vibrated with respect to the supporting means.

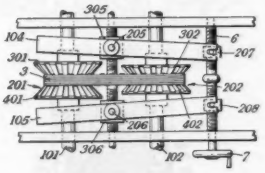
3,916,705

VARIABLE SPEED TRANSMISSION GEAR BOXES

Brian Frank Smith, Oldham, and Norman Partington, Woodford, both of England, assignors to Platt International Limited, England

Filed Jan. 18, 1974, Ser. No. 434,676
Claims priority, application United Kingdom, Jan. 19, 1973, 2796/73
Int. Cl.² F16H *55/52*
U.S. Cl. 74—230.17 A **16 Claims**

1. An automatic tensioning arrangement for tensioning a flexible endless driving member in a positive infinitely variable speed gear including: an input shaft; an input cone pulley formed by a pair of discs having opposed conical faces and mounted on the input shaft for relative axial movement; an output shaft; an output cone pulley formed by a pair of discs having opposed conical faces and mounted on the output shaft for relative axial movement; the flexible endless driving member passes around the input cone pulley and the output cone pulley thereby transmitting a drive force between the pulleys; a pair of pivotal control levers, the ends of one of the levers being connected to one of the discs of the input pulley and one of the discs of the output pulley and the ends of the other lever being connected to the other of the discs of the input pulley and the other of the discs of the output pulley; two fulcrum elements, each pivotally supporting one of the control levers; means for pivoting the control levers about the fulcrum elements to differentially vary the effective driving diameters of the input and output pulleys and change the speed ratio between the input shaft and the output shaft; a tensioning shaft having a first screw threaded portion of one hand on the tensioning shaft for supporting one of the fulcrum elements



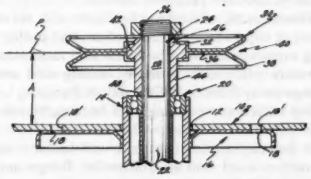
and a second screw threaded portion of the other hand on the tensioning shaft for supporting the other of the fulcrum elements; the automatic tensioning arrangement comprising:
gear drive transmission means having a rotatable gear member and an angularly movable tensioning input shaft;
means for locking the tensioning input shaft in any one of a number of angular positions;
torque applying spring connected at one end to the tensioning shaft and at the other end to the rotatable gear member whereby rotation of the tensioning input shaft in one direction rotates the rotatable gear member to tension the torque applying spring which urges the two fulcrum elements towards each other so as to maintain the flexible endless driving member under a predetermined tension and which takes up gradual wear in the flexible endless driving member by movement of the two fulcrum elements towards each other as such wear occurs and whereby rotation of the tensioning input shaft in the other direction relaxes the torque applying spring.

3,916,706

MOWER DRIVE SHAFT AND PULLEY

Thomas E. Shaw, Grandville, Mich., assignor to C. L. Frost & Son, Inc., Grand Rapids, Mich.

Filed Nov. 28, 1973, Ser. No. 419,701
Int. Cl. F16h *55/36, 55/34*
U.S. Cl. 74—230.01 **6 Claims**



1. A rotary mower comprising, in combination: a rotatable shaft mounted in bearings, a housing for said shaft and bearings; a deck support on said housing for mounting said shaft and housing to a mower deck; means for attaching a drive

pulley to one end of said shaft; and a drive pulley receivable on said one end of said shaft, said drive pulley having a hub engageable with said one end of said shaft, said hub member extending dissimilar axial lengths to each side of said pulley whereby said hub and pulley are positionable on said shaft in two selected positions wherein said pulley may be located in two preselected distances from said mower deck when mounted on said shaft.

3,916,707

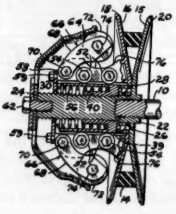
CENTRIFUGAL PULLEY WITH MOVABLE FLANGE SUPPORTED BY ROLLERS ON A SQUARE SHAFT

David L. Wells, P.O. Box 593, Dubois, Wyo. 82513

Filed Sept. 26, 1974, Ser. No. 509,994

Int. Cl.² F16H *55/52*

U.S. Cl. 74—230.17 E **4 Claims**



1. A centrifugal clutch assembly, comprising:

a drive shaft;

a first pulley flange mounted on said shaft for rotation therewith;

a second pulley flange axially opposite said first pulley flange, said first and second pulley flanges having confronting conical faces which cooperate to form a V-belt groove;

bearing means mounting said second pulley flange for movement toward and away from said first pulley flange, said bearing means including a race means coaxially secured to said shaft for rotation therewith,

said race means having a plurality of outer surfaces forming longitudinal platforms extending parallel with the axis of said shaft,

a bearing support connected with said second flange and overlying the respective said race means platform, and, antifriction bearings secured to and supporting each said bearing support in spaced relation with respect to the respective platform surface;

a pressure plate extending between and secured to said bearing supports opposite said second pulley flange;

spring means interposed between said race means and said pressure plate and normally biasing said second pulley flange away from said first pulley flange;

housing means surrounding said bearing means and axially connected for rotation with said shaft,

said housing means having a wall surface curving arcuately toward said second pulley flange and forming a cam surface; and,

flyweights pivotally secured to said bearing supports and being contrifugally biased outwardly above predetermined angular rates of rotation of said drive shaft into contact with said cam surface for forcing said second pulley flange toward said first pulley flange.

3,916,708

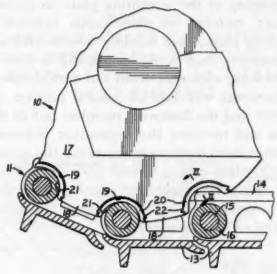
REPLACEABLE INSERT FOR THE DRIVE SPROCKET OF A TRACK-TYPE VEHICLE

James C. Durand, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 6, 1974, Ser. No. 503,594

Int. Cl.² F16H *55/30*

U.S. Cl. 74—243 R **21 Claims**



16. A replaceable insert in combination with a of a track-type vehicle, said insert being composed of a hardened metallic material and having a general U-shape to define a substantially smooth and uninterrupted root profile thereon, and a plurality of retaining tabs integrally formed on said insert, attaching and resiliently biasing said insert within a U-shaped notch of said drive sprocket.

3,916,709

LINK CHAIN

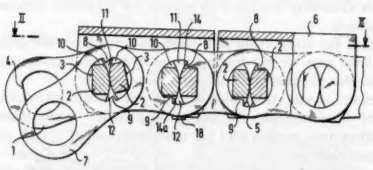
Herbert Steuer; Raimund Pataky, both of Bad Homburg vor der Hobe, and Walter Ketterle, Oberursel, all of Germany, assignors to P.I.V. Antrieb Werner Reimers Kommanditgesellschaft, Bad Homburg vor der Hobe, Germany

Filed Oct. 30, 1974, Ser. No. 519,199

Claims priority, application Germany, Nov. 10, 1973, 2356289

Int. Cl.² F16G *13/02*

U.S. Cl. 74—253 R **6 Claims**



1. In a link chain having a plurality of serially arranged links each formed of a stack of elongated link plates, each link plate having two spaced, generally circular openings; a link pin extending through each opening of overlapping links for connecting them together, each link pin being formed of a pair of rockers; the rockers having arcuate surfaces rolling on one another and means defining notches along their length, the notches extending in a direction transversal to the longitudinal orientation of the link plates; and two free spaces defined between adjoining arcuate surfaces of the rockers forming each link pin, the improvement wherein at least one plate of each link is a locking plate, said locking plate having two detents projecting into solely one of the openings of the locking plate from diametrically opposite locations of said solely one opening, each detent of each locking plate being situated in a notch of different rockers of the same link pin when the

locking plate is in alignment with the other link plates of the same link, each detent of any one locking plate moving into one and the other free spaces between the rockers when the locking plate is pivoted about the rockers with respect to the remaining plates of said one link.

3,916,710

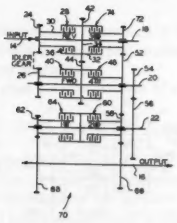
TRANSMISSIONS

Ronald L. Sisson, and James E. Shellberg, both of Jackson, Mich., assignors to Clark Equipment Company, Buchanan, Mich.

Division of Ser. No. 392,139, Aug. 27, 1973, Pat. No. 3,858,455. This application Sept. 9, 1974, Ser. No. 504,585

Int. Cl.² F16H *3/08*

U.S. Cl. 74—331 **3 Claims**



1. A transmission comprising:

a. an input shaft;

b. a first gear fixed to said input shaft;

c. a first shaft lying in a common plane with said input shaft;

d. a second gear journalled for rotation on said first shaft and drivingly connected with said first gear;

e. a second shaft axially aligned with said input shaft;

f. first clutch means for connecting said input shaft with said second shaft;

g. second clutch means for connecting said second gear to said first shaft for conjoint rotation therewith;

h. a third gear fixed to said second shaft;

i. a fourth gear fixed to said first shaft and in mesh with said third gear;

j. a fifth gear journalled for rotation on one of said first and second shafts;

k. third clutch means for connecting said fifth gear to one of said first and second shafts for conjoint rotation therewith;

l. a third shaft lying in a common plane with said input shaft;

m. an output shaft;

n. a sixth gear fixed to said first shaft;

o. a seventh gear fixed to said third shaft and in mesh with said sixth gear;

p. an eighth gear journalled for rotation on said first shaft and in mesh with said fifth gear;

q. fourth clutch means for connecting said eighth gear to said first shaft for conjoint rotation therewith;

r. a ninth gear journalled for rotation on said third shaft;

s. fifth clutch means for connecting said ninth gear to said third shaft for conjoint rotation therewith;

t. a tenth gear journalled for rotation on said third shaft and in mesh with said eighth gear;

u. sixth clutch means for connecting said tenth gear to said third shaft for conjoint rotation therewith;

v. an eleventh gear fixed to said output shaft and in mesh with said ninth gear; and

w. a twelfth gear fixed to said output shaft and in mesh with said tenth gear, with said output shaft being vertically aligned with said input shaft.

3,916,711

CHANGE GEAR TRANSMISSION, ESPECIALLY FOR MOTOR VEHICLES USED FOR AGRICULTURAL PURPOSES AND THE CONSTRUCTION INDUSTRY

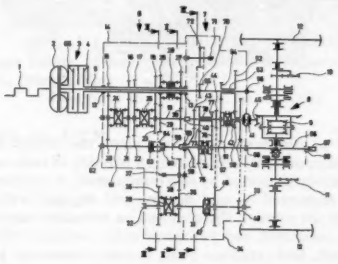
Manfred Hoyer, Bergisch Gladbach-Schildgen, Germany, assignor to Klockner-Humboldt-Deutz Aktiengesellschaft, Germany

Filed Aug. 13, 1973, Ser. No. 387,941

Claims priority, application Germany, Aug. 14, 1972, 2239955

Int. Cl.² F16H *3/08, 37/08, 3/02*

U.S. Cl. 74—360 **17 Claims**



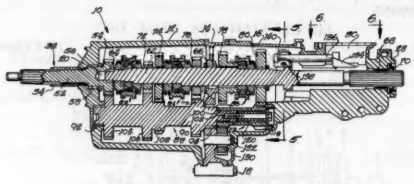
1. A change gear transmission, especially for agricultural and construction industry vehicles, comprising; a first multiple step transmission group having only one input shaft (**5**) and a first counter shaft (**19**), first meshing gears (**15, 20; 16, 21; 17, 22; 18,23; 26,29; 27,30**) on said shafts and first clutch means (**24, 25, 28**) operable for making said first meshing gears selectively effective for drivingly interconnecting said shafts at a plurality of drive ratios, a second multiple step transmission group having an output shaft (**45**) and a second counter shaft (**31**) parallel to the first counter shaft, second meshing gears (**48, 49; 44, 46**) including gears on said output shaft and second counter shaft and second clutch means (**47, 51**) operable for making said second gears selectively effective for drivingly interconnecting said output shaft and second counter shaft at a plurality of drive ratios and for reversible rotation of said output shaft during one and the same direction of rotation of said first counter shaft, third meshing gears (**29, 35; 30, 38, 36**) including gears on said first counter shaft and said counter shaft and third clutch means (**39**) operable for making said third gears selectively effective for drivingly interconnecting said counter shafts directly at a plurality of drive ratios and selectively for reversible rotation of said second counter shaft during rotation of said first counter shaft in one and the same direction.

17. In a change gear transmission; an input shaft (**5**) rotatable in one direction, an output shaft (**45**) rotatable in opposite directions and at a plurality of different speeds for a single speed of said input shaft, a first counter shaft (**19**) adjacent said input shaft and a second counter shaft (**31**) adjacent said output shaft, all of said shafts being parallel, first gearing (**15, 20; 16, 21; 17, 22; 18, 23; 26, 29; 27, 30**) connecting said input shaft with said first counter shaft operable to drive said first counter shaft in one direction and establishing a plurality of drive ratios between said input shaft and said first counter shaft, second gearing (**29, 35; 30, 38, 36**) connecting said first counter shaft with said second counter shaft for driving said second counter shaft in opposite directions and establishing at least one drive ratio between said first counter shaft and said second counter shaft in each direction of rotation of said second counter shaft, and third gearing (**48, 49; 46, 44; 50, 52, 54, 57**) connecting said second counter shaft with said output shaft for driving said output shaft in a respective direction for each direction of rotation of said second counter shaft, said third gearing establishing a plurality of drive ratios between said second counter shaft and said output shaft.

3,916,712
TRANSMISSION WITH TRANSVERSELY MOVABLE COUNTERSHAFT EXTENSION

Donald W. Kelbel, and John W. Holdeman, both of Muncie, Ind., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Feb. 11, 1974, Ser. No. 441,679
Int. Cl.[2] F16H *57/02;* **F16D** *3/18*
U.S. Cl. 74—410 **4 Claims**



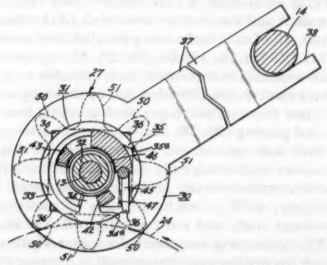
1. In a transmission, a housing, input and output shafts rotatably supported by said housing, a plurality of ratio output gears rotatably supported by said output shaft, a countershaft rotatably supported by said housing and engaged with said input shaft for rotation thereby, and an extension supported by said countershaft and said housing for rotation with said countershaft, said extension being movable transverse to the axis of rotation of said countershaft, said countershaft and extension each defining at least one ratio input gear, said ratio input gears respectively engaged with said ratio output gears, said ratio output gears selectively engageable with said output shaft for establishing a plurality of drive ratios.

4. In combination, a housing, a shaft having a main portion of relatively large diameter journalled in first and second bearings in said housing, said shaft extending through said second bearing and having an end portion of relatively small diameter defining an upstanding boss thereon, said portions defining a limit stop therebetween, a shaft extension journalled in a third bearing in said housing, said extension including a spacer secured to said end portion and extending axially therefrom, a limit stop secured to said spacer, and a sleeve splined to said end portion and axially movable between said limit stops guided by said boss, said sleeve being pivotal transversely about said boss to compensate for misalignment of said bearings.

3,916,713
SNAP ACTION TRANSFER PINION

Einar T. Young, Newtown Square, Pa., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Jan. 22, 1975, Ser. No. 542,972
Int. Cl.[2] F16H *57/00, 55/18*
U.S. Cl. 74—411 **12 Claims**



1. In a gear having at least two lateral sections, each section having gear teeth around its circumference, an improvement which delays the rotation of the driven section until the driving section has rotated a predetermined amount comprising:

a. means for storing energy from the rotational motion of the driving section,

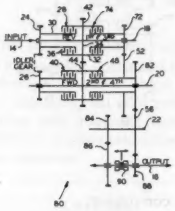
b. means for preventing the driven section from rotating, and

c. means to release the stored energy when the driving section has rotated a predetermined distance, thereby causing the driven section to rotate.

3,916,714
TRANSMISSIONS

Ronald L. Sisson, and James E. Shellberg, both of Jackson, Mich., assignors to Clark Equipment Company, Buchanan, Mich.

Division of Ser. No. 392,139, Aug. 27, 1973, Pat. No. 3,858,455. This application Sept. 9, 1974, Ser. No. 504,584
Int. Cl.[2] F16H *3/08*
U.S. Cl. 74—331 **4 Claims**



1. A transmission comprising:

a. an input shaft;

b. a first gear fixed to said input shaft;

c. a first shaft lying in a common plane with said input shaft;

d. a second gear journalled for rotation on said first shaft and drivingly connected with said first gear;

e. a second shaft axially aligned with said input shaft;

f. first clutch means for connecting said input shaft with said second shaft;

g. second clutch means for connecting said second gear to said first shaft for conjoint rotation therewith;

h. a third gear fixed to said second shaft;

i. a fourth gear fixed to said first shaft and in mesh with said third gear;

j. a fifth gear journalled for rotation on one of said first and second shafts;

k. third clutch means for connecting said fifth gear to one of said first and second shafts for conjoint rotation therewith;

l. a third shaft lying in a common plane with said input shaft;

m. an output shaft;

n. a sixth gear journalled for rotation on said first shaft;

o. a seventh gear fixed to said third shaft and in mesh with said sixth gear;

p. an eighth gear journalled for rotation on said first shaft and in mesh with said fifth gear;

q. fourth clutch means for connecting said sixth and eighth gears to said first shaft for conjoint rotation therewith;

r. a ninth gear fixed to said third shaft;

s. a tenth gear journalled for rotation on said output shaft and in mesh with said ninth gear;

t. an eleventh gear journalled for rotation on said output shaft and in mesh with said seventh gear; and

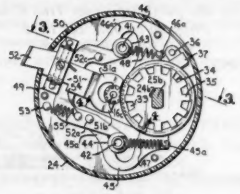
u. means for alternately connecting said tenth and eleventh gears to said output shaft for conjoint rotation therewith, with said output shaft being vertically aligned with said input shaft.

3,916,715

INSERT (SUBSTITUTE) DRIVE GEARS TO PRODUCE FAST RETRIEVE IN CERTAIN FISHING REELS

Leslie V. Covey, Highway 265, Box 835, Branson, Mo. 65616

Filed Jan. 25, 1974, Ser. No. 436,660
Int. Cl.[2] F16H 1/06; A01K 89/00
U.S. Cl. 74—414 4 Claims



1. An integral pinion gear construction for insertion into a Garcia-ABU 5000-6000 Series reel comprising a longitudinally bored member including:

a first outboard gear bearing portion of a first uniform outer diameter,

an intermediate shank section of a second, lesser outer diameter, and

a third inboard portion of increasing outer diameter starting equal to the first portion next the shank and flaring to a greater outer diameter at the inboard end thereof,

the third portion internally relieved at the lower end thereof for engagement with the spool shaft clutch of the said reel.

3,916,716

FINE-TOOTHED GEAR PAIR CONSISTING OF SYNTHETIC MATERIAL

Albert Rix; Hans Fuchs; Rolf Moritz, all of Wilhelmshaven, and Erhard Ubben, Aurich-Popens, all of Germany, assignors to Olympia Werke AG, Wilhelmshaven, Germany

Filed Jan. 16, 1975, Ser. No. 541,561
Int. Cl.[2] F16H 55/14, 55/06
U.S. Cl. 74—461 4 Claims

1. In a fine-toothed gear pair formed of a driving gear member and a driven gear member; the teeth of one gear member being made of a fully elastic material and the teeth of the other gear member being made of a material which is less elastic than the other, each tooth having a head flank and a foot flank; the improvement wherein the shape of the teeth being such that, when the meshing parts of the two gear members are passing the geometrical connection line between the center points of curvature of the two gear members,

a. a full surface touching occurs between the head flank of the teeth of the less elastic gear member and the foot flank of the teeth of the fully elastic gear member;

b. the direction of load of the meshing teeth of the tooth gear pair is normal to the foot flank of the teeth of the fully elastic gear member; and

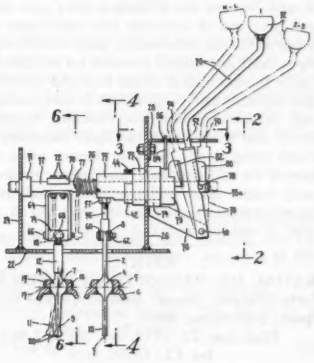
c. the head flank of the teeth of the less elastic gear member is inclined approximately by 5° steeper with regard to the foot flank of the teeth of the fully elastic gear member for effecting only a small deformation in the direction of the deepest point of the foot flank of the teeth of the fully elastic gear member.

3,916,717

SINGLE LEVER GEAR SHIFT CONTROL

Herman Heintz, Livonia, Mich., assignor to Massey-Ferguson Inc., Detroit, Mich.

Filed Nov. 15, 1974, Ser. No. 524,102
Int. Cl.[2] G05G 9/12
U.S. Cl. 74—473 R 21 Claims

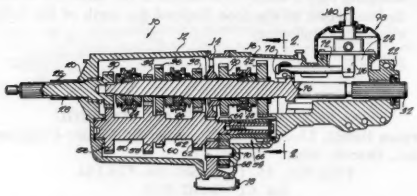


1. Transmission control apparatus comprising a first shifting member movable in a first shifting plane between at least one active position and neutral position; a second shifting member movable in a second shifting plane between at least one active position and neutral position, and in a third shifting plane between at least one active position and neutral position; a single control lever selectively movable in a neutral control plane intersected by first, second and third control planes, said control lever being selectively movable in said first, second and third control planes when moved to the respective intersections thereof with said neutral control plane; and shift mechanism interconnected with said control lever and shifting members operable to (1) cause said first shifting member to move in said first shifting plane in response to corresponding movement of said control lever in said first control plane, (2) cause said second shifting member to move in said second shifting plane in response to corresponding movement of said control lever in said second control plane with said first shifting member located at any selected position in said first shifting plane, and (3) cause said second shifting member to move in said third control plane in response to corresponding movement of said control lever in said third control plane with said first shifting member located at any desired position in said first shifting plane.

3,916,718
TRANSMISSION CONTROL

Donald W. Kelbel, and John W. Holdeman, Muncie, Ind., assignors to Borg-Warner Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 441,679, Feb. 11, 1974. This application May 24, 1974, Ser. No. 473,026
Int. Cl.² G05G 9/12
U.S. Cl. 74—471 R **17 Claims**

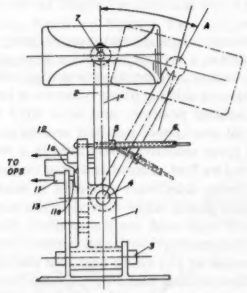


1. In a transmission, a housing, input and output shafts respectively journalled in said housing, said input shaft defining an input gear, at least one ratio output gear rotatably supported on said output shaft, a cluster gear assembly journalled in said housing and defining a drive gear meshing with said input gear and at least one ratio input gear in meshing relationship with said ratio output gear, means supported by said output shaft and axially movable for clutching said ratio output gear to said output shaft, first and second shift rails supported adjacent said output shaft in said housing for rotational and axial movement, said clutching means being engageable by said second shift rail upon rotational movement thereof and being axially movable thereby upon axial movement thereof for said clutching, and linkage means extending about said output shaft and connecting said shift rails for effecting movement of said second shift rail in response to movement of said first shift rail.

3,916,719
OPERATING MECHANISM FOR A MOTOR VEHICLE

Carl Maria Zwerenz, Vienna, Austria, assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Apr. 22, 1974, Ser. No. 462,983
Int. Cl.² G05G 9/02
U.S. Cl. 74—478 **11 Claims**

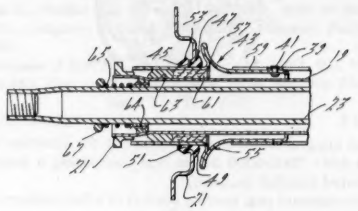


1. An operating mechanism for a motor vehicle, comprising a foot-operated brake and motor speed control lever, the lever being mounted for pivoting about a first axis into a position to brake the vehicle and for pivoting about a second axis extending transversely to the first axis, the lever being pivotal about the second axis between an idling position and motor speed control position, a return means for moving the lever from the motor speed control position to the idling position when the lever is pivoted about the first axis into the braking position, and two limit switches for actuating the return means upon simultaneously energizing a first one of the switches and de-energizing a second one of the switches.

3,916,720
ENERGY ABSORBING STEERING COLUMN

Robert J. Smith, Warren, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed May 14, 1973, Ser. No. 360,296
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² B62D 1/18
U.S. Cl. 74—492 **4 Claims**

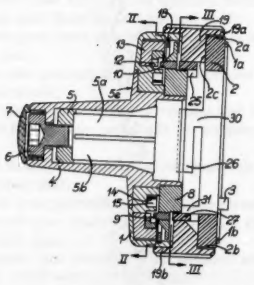


1. A die device for a tubular energy absorbing steering column jacket comprising a movable die means connected to a floorboard of a vehicle and movable with respect thereto, said die means moving toward said floorboard when a force of a predetermined magnitude is applied to the upper end thereof, said die means comprising a tubular member having a forward tubular portion and a rearward tubular portion, and a curved die portion between said tubular portions, said die portion being formed by the wall of said tubular member being folded upon itself.

3,916,721
LOCKABLE ROTATABLE KNOB

Erwin Egger, Bulle, Switzerland, assignor to Decobul S.A., Switzerland

Continuation-in-part of Ser. No. 394,646, Sept. 5, 1973, abandoned. This application July 3, 1974, Ser. No. 485,622
Claims priority, application Switzerland, May 22, 1974, 7024/74
Int. Cl.² G05G 1/10
U.S. Cl. 74—553 **7 Claims**



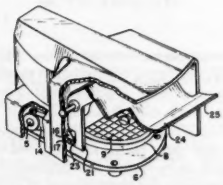
1. Control knob apparatus comprising; a housing having a generally cylindrical outside surface; a control knob coaxial with said housing, an end of said knob being mounted in said housing and having an outer cylindrical brake surface; a stationary brake ring, coaxially secured to said housing and having a plurality of resilient brake fingers thereon, disposed outside of and adjacent to said outer cylindrical brake surface, each finger extending over an arcuate portion of said surface; a shiftable brake actuator ring coaxially surrounding said

resilient brake fingers; mutually coacting cam means on said shiftable ring and on said resilient brake fingers for resiliently radially urging said resilient brake fingers into braking contact with said cylindrical brake surface, on displacement of said brake actuator ring in one direction over a limited distance which is minor compared with the circumference of said cylindrical brake surface, to lock the knob, and for resiliently releasing said brake means on displacement of said shiftable brake actuator ring in an opposite direction over said limited distance; and means coaxial with and adjacent to the outside surface of the housing and manually engageable for displacing said shiftable brake actuator ring in either direction over said limited distance.

3,916,722
TREADLE OPERATED CONTROL

Donald F. Grobe, Asheville, N.C., assignor to Square D Company, Park Ridge, Ill.

Filed Oct. 17, 1974, Ser. No. 515,592
Int. Cl.² G05G *1/14*
U.S. Cl. 74—512 **8 Claims**



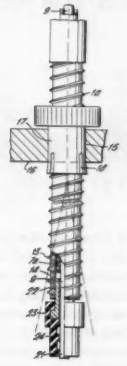
1. A foot control including
a base;
a treadle mounted on the base for movement in one direction to an active position and in an opposite direction to an inactive position;
means biasing the treadle to, and yieldably holding it in, said inactive position;
a movable latch mechanism carried by the base and normally held in a latching position in which it latches the treadle in said inactive position, and movable from latching position to a release position in which it releases the treadle for movement to said active position;
said latch mechanism including a movable latch releasing member which is in a normal position when the latch mechanism is in latching position, and which is movable in a predetermined direction from its said normal position to a release position in which it moves the latch mechanism into its said release position;
characterized in that said latch releasing member and treadle are mounted in relation to each other such that said predetermined direction of movement of the latch releasing member is generally opposite to said one direction of movement of the treadle.

3,916,723
TRANSMISSION MECHANISMS

George Hawtree, Llanelli, and Edgar Hoyle, Mount Pleasant, both of Wales, assignors to Bowden Controls Limited, Llanelli, Wales

Filed Jan. 17, 1973, Ser. No. 324,426
Claims priority, application United Kingdom, Jan. 26, 1972, 3727/72
Int. Cl.² F16C *01/20, 01/06*
U.S. Cl. 74—501 R **9 Claims**

1. A flexible force-transmitting mechanism of the type comprising a flexible conduit, a core member movable within said conduit, and conduit securing means which is adjustable along the conduit; wherein at least part of the conduit is formed of closely helically interwound wires forming helices of different external diameters, thereby to give said conduit part the form of a male screw of which the thread is formed by one wire and the root portion thereof being formed by the other wire; wherein said thread-forming wire has a cross-section which tapers towards the axis of the conduit and said root-forming wire is of substantially flat elongated section with its major sectional dimension parallel with said axis so that said male screw has a groove of substantially dovetail section;

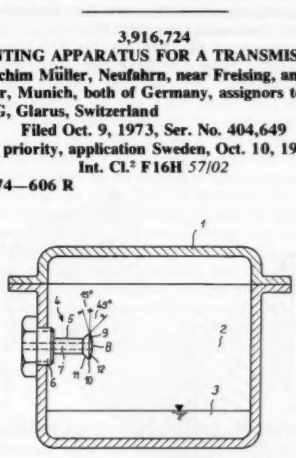


said securing means comprising at least one female threaded plastics nut member having a portion which is externally tapered for wedging into an aperture in a plate-like fixture and which is axially slotted at positions angularly spaced about its axis whereby said externally tapered portion can be forced radially inwardly against said male screw under such wedge action.

3,916,724
VENTING APPARATUS FOR A TRANSMISSION

Hans Joachim Müller, Neufahrn, near Freising, and Gerhard Sendner, Munich, both of Germany, assignors to Buro Patent AG, Glarus, Switzerland

Filed Oct. 9, 1973, Ser. No. 404,649
Claims priority, application Sweden, Oct. 10, 1972, 14755
Int. Cl.² F16H *57/02*
U.S. Cl. 74—606 R **6 Claims**



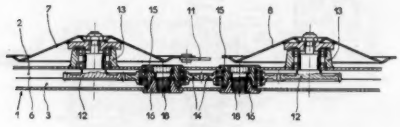
1. The combination with a transmission incorporating a transmission housing containing lubricant of a vent apparatus communicating with said transmission housing, said transmission housing including an internal compartment located above the level of the lubricant therein, said vent apparatus comprising a tubular-shaped probe having arranged therein a vent channel continuously communicating said internal compartment with the atmosphere, said tubular-shaped probe having an end equipped with a drip flange and extending such an extent into the transmission housing that said end equipped with said drip flange is located above the level of the lubricant in all positions of the transmission.

3,916,725

GEAR BOX CARRYING ROTARY SCYTHE MOWER ROTORS DRIVEN FROM UNDERNEATH

Walter Reber, Saverne, France, assignor to Kuhn S.A., Saverne, France

Filed Apr. 11, 1974, Ser. No. 460,131
Claims priority, application France, May 7, 1973, 73.17015
Int. Cl.[2] F16H 57/02
U.S. Cl. 74—606 R 4 Claims



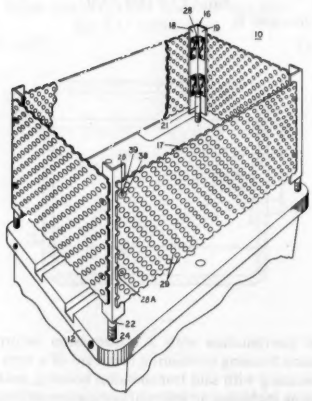
1. A gear box carrying rotary scythe mower rotors, comprising an upper half box and,a lower half box disposed beneath the rotors, a train of pinions in the box for effecting the drive of said rotors, certain of said pinions being intermediate the rotors, upper sockets secured to the upper half box, said intermediate pinions being mounted for rotation on said upper sockets, lower sockets secured to said lower half box, said lower sockets fitting partially into said upper sockets, tightening screws having heads that bear on said upper sockets, said screws extending through said upper sockets and being screw threadedly engaged only with said lower sockets, and packing between said upper and lower sockets.

3,916,726

GUARD STRUCTURE FOR A WORK TABLE

Raymond L. Springer, c/o The Auto Sun Products Co., 529 Poplar St., Cincinnati, Ohio 45214

Filed Mar. 14, 1974, Ser. No. 451,310
Int. Cl.[2] F16P 1/02
U.S. Cl. 74—612 4 Claims



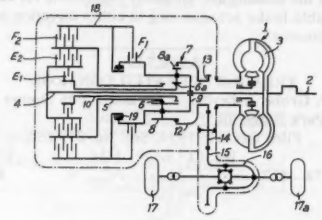
1. A guard structure for a work table of a machine tool which comprises a pair of posts, each of said posts having a threaded shank portion threadably supported by the table, a guard plate means spanning the posts, and spring locked fastener means releasably attaching the guard plate to the posts, the guard plate preventing turning of the posts.

3,916,727

VEHICLE TRANSMISSIONS

Jean Piret, Bougival, France, assignor to Regie Nationale des Usines RENAULT, Billancourt and Automobiles PEUGEOT, Paris, both of, France

Filed June 10, 1974, Ser. No. 477,634
Claims priority, application France, July 9, 1973, 73.25106
Int. Cl.[2] F16H 47/08, 47/00, 57/10
U.S. Cl. 74—688 5 Claims



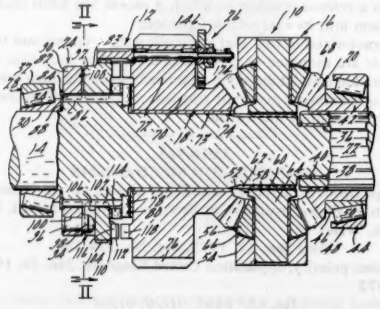
1. In an automatic vehicle transmission of the kind comprising of a planetary gear train transmission mechanism, a hydrodynamic torque-converter, a differential, a main housing for said mechanism and a main housing for said converter these latter being separable along a plane perpendicular to the axis of rotation of said gear train, braking and clutch members including friction discs which are controlled by ram means which co-operate with the components of said planetary gear train, and a pump to supply said ram means, the improvement wherein said main housing contains a detachable partition and bearing support having a front face which is directed towards said converter housing, and a rear face which forms a contact surface for said friction discs included in said braking member and for return members of a piston of said ram means.

3,916,728

INTER-AXLE DIFFERENTIAL LOCK

Marcel N. Behar, Southfield, and Timothy J. Morscheck, Warren, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed June 12, 1973, Ser. No. 369,355
Int. Cl.[2] F16H 1/44
U.S. Cl. 74—711 16 Claims



1. An improved lock mechanism for a differential gear device of the type having an input member rotatively driven by an input shaft and two output members rotatively driven by said input member, said lock mechanism comprising:

A. a shaft journaled in one of said differential members;

B. a mass of predetermined moment of inertia

1. mounted for rotation in said one differential gear member, and

2. journaled for rotation about an axis spaced from said journaled shaft;

C. first drive means connecting said journaled shaft to said mass;

D. second drive means connecting said journaled shaft to another of said differential gear members so that said shaft and mass are rotated in response to relative rotation between said one differential gear member and said other differential gear member and a force is generated by said shaft and mass in response to relative acceleration between said one differential gear member and said other differential gear member; and

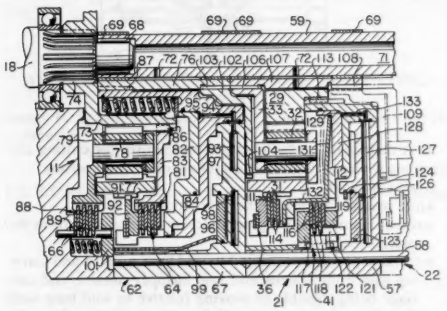
E. means responsive to said force to restrict differential rotation of said differential gear members.

3,916,729

MODULAR POWER TRANSMISSION WITH SELF-ENERGIZING DEVICE

Charles H. Herr, Peoria, Ill., assignor to Caterpillar Tractor Company, Peoria, Ill.

Filed Apr. 8, 1974, Ser. No. 459,109
Int. Cl.[2] F16H *3/54*
U.S. Cl. 74—751 **13 Claims**



1. A power transmission module providing both direct and reduction drive ratios, comprising

an input shaft,

an output shaft,

a planetary gear set having a sun gear, a ring gear and a plurality of planetary gears mounted upon a rotatable carrier and engaged with the sun gear and ring gear, the input shaft being coupled for rotation with the ring gear and the output shaft being coupled for rotation with the carrier,

a direct drive clutch having relatively rotatable friction components respectively coupled for rotation with different portions of the planetary gear set and being selectively operable to cause rotation of the ring gear together with the sun gear,

a self-energizing reduction brake having a pair of relatively rotatable friction components coupled respectively to the sun gear and a fixed member of the power transmission module for operation independently of the direct drive clutch, the reduction brake including means responsive to torque forces acting on the sun gear in either direction of rotation for selectively initiating engagement of its friction components to lock the sun gear against rotation, one of the friction components in the direct drive clutch being fixed to one of the friction components in the reduction brake,

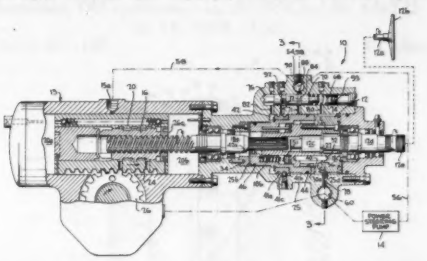
common control means operatively coupled with the direct drive clutch and the reduction brake for selectively engaging the direct drive clutch to cause rotation of the ring gear together with the carrier and substantially simultaneously conditioning the reduction brake for operation in an overrunning mode to prevent it from engaging in response to torque forces acting upon the sun gear.

3,916,730

SWITCHABLE RATIO STEERING SYSTEM

Richard H. Sheppard, c/o R. H. Sheppard Co., Inc., Hanover, Pa. 17331

Filed Dec. 27, 1973, Ser. No. 428,728
Int. Cl.[2] F16H *3/74;* **B62D** *5/06*
U.S. Cl. 74—751 **13 Claims**



1. In a vehicle steering system including a rotatable steering command shaft and power steering unit powered by a hydraulic pump source, said power steering unit including a rotatable input shaft, a coupling between said steering command shaft and said power steering unit, said coupling being characterized by a first steering ratio mode for manual emergency steering operation and a second mode for power operation, said coupling comprising a housing having a bore; a planetary gear set including at least three coaxial interacting gear means mounted within said bore and comprising central sun gear means, ring gear means coaxially surrounding the sun gear means and planet gear means disposed in meshing relationship with said sun gear and ring gear means, first and second ones of said three gear means being respectively connected to the steering command shaft and to said input shaft; brake means for holding a third one of said gear means to establish the first steering ratio mode; and clutch means for relatively locking together the three gear train means for rotation as a unit to establish the second steering ratio mode; and shift means responsive to the pressure generated by said pump source to cause engagement of a selected one of said brake and clutch means, said first steering ratio being greater than said second steering ratio to allow easier turning of said command shaft in emergency situations upon loss of hydraulic pressure, said shift means including means for axially sliding said third one of said gear means with said bore between two positions for engaging the brake means in a first position and engaging the clutch means in the second position, said third gear means being a ring gear and forming an integral piston slidable and rotatable as a whole in a chamber formed by said bore, seal means on said integral piston to allow direct high pressure fluid action on at least one side of the integral piston for sliding.

3,916,731

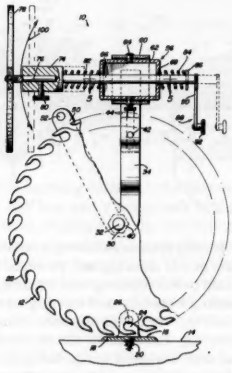
CIRCULAR SAW BLADE SHARPENER

Keith L. Kincaid, 1530 Washington, E., Charleston, W. Va. 25311

Filed June 18, 1974, Ser. No. 480,500
Int. Cl.[2] B23D *63/12*
U.S. Cl. 76—41 **4 Claims**

1. A device for sharpening peripheral teeth on a circular saw blade, said device comprising a drive shaft, an abrasive disc secured to the drive shaft, a pivotal carrier assembly rotatably and slidably mounting the drive shaft for rotation and longitudinal shifting of the shaft relative to the carrier assembly about and along, respectively, a first rotational axis spaced from the saw blade, means mounted on the carrier assembly for continuously biasing the shaft to a centered position intermediate limit positions of shifting of said shaft relative to said carrier assembly, support means pivotally

mounted on the saw blade within the central opening thereof and supporting the carrier assembly therefrom for angular displacement of the carrier assembly relative to the saw blade about the center axis of the saw blade comprising a second axis, said support means including a pair of generally parallel adjustable length support arms extending generally radially of said blade on opposite sides thereof, said carrier assembly being pivotally supported between said support arms outwardly of the peripheral teeth on said blade for displacement about a third axis extending between said support arms, a carrier block oscillatably supported from said carrier assembly for displacement about a fourth axis normal to said first and third axes and contained in the plane of said blade, and actuating means connected to the drive shaft for (1) axial displacement of said shaft along said first axis for engagement of said disc with the peripheral teeth of the saw blade and (2) rotation of said shaft.



3,916,732

ICE REMOVING TOOL

Russell E. Caldwell, 324 2nd St., NE., Watertown, S. Dak. 57201

Filed Dec. 11, 1974, Ser. No. 531,766
Int. Cl.[2] B25B *9/00;* **B08B** *11/00*
U.S. Cl. 81—3 R **4 Claims**

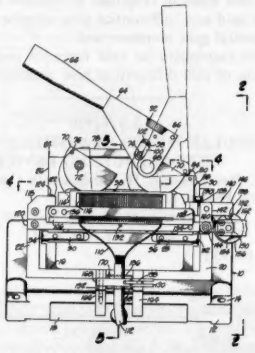
1. A hand manipulated ice removing tool comprising an elongate insulated handle shaft, a yoke secured to the upper end of said shaft, a pulley wheel journalled in said yoke for engaging a cable to be deiced, and means on said yoke for guiding said yoke onto the cable.

3,916,733

WIRE CUTTER-STRIPPER

John Meadows, Palo Alto, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Feb. 14, 1974, Ser. No. 442,398
Int. Cl.[2] H02G *1/12*
U.S. Cl. 81—9.51 **14 Claims**



1. A multi-wire, cutter-stripper mechanism for cutting and stripping a plurality of wires simultaneously, comprising

a base support;

knife means for cutting the plurality of wires;

stripper means for stripping a section of insulation from the plurality of wires;

a carriage pivotally mounted to said base support and carrying said knife means and said stripper means, said carriage being capable of moving relative to said base such that the stripper means will draw the insulation from the wires; and

lever means operably associated with said knife means and said stripper means to actuate said knife and said stripper means when moved in a first direction and mounted on said carriage to pivot said carriage when moved in a second, different direction.

3,916,734

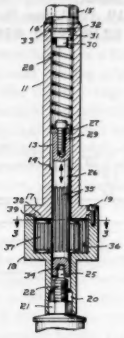
TOOL FOR USE IN REMOVING AUTOMOBILE SHOCK ABSORBERS

Anis S. Sawan, 10 Granfield Ave., Roslindale, Mass. 02131

Filed Aug. 21, 1974, Ser. No. 499,338
Int. Cl.[2] B25B *17/00*
U.S. Cl. 81—56 **5 Claims**

1. A tool for use in freeing a nut from a bolt of a type having its nut-receiving end provided with a diametrically disposed rib, said tool comprising a tubular member of substantial length and provided with a chamber intermediate its ends of a cross sectional area greater than the remainder thereof, said chamber including a fixed, internally toothed ring gear concentric with the shaft, one end of said member including a nut portion to be gripped by a first wrench and having a nut-fitting socket at its other end, a shaft slidable and rotatable within said tubular member and including a head at one end having a channel shaped and dimensioned to fit the rib of the bolt, said shaft through said chamber and towards said one end of the tubular member, means operable to connect said shaft to said tubular member to limit axial movement of said shaft relative threrto between a position in which the head is within the socket and a predetermined position remote therefrom, said shaft including a circumferential series of gear teeth of an exial extent such that a lengthwise portion thereof is within the

chamber in either of said positions of the shaft, and a series of idler gears within the chamber in mesh with the ring gear and



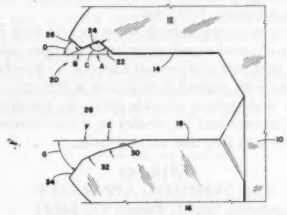
the portion of the teeth of the shaft that is within said chamber.

3,916,735

ADJUSTABLE MULTIPLE PURPOSE RATCHETING WRENCH

James P. Evans, Oklahoma City, Okla., assignor to Paul H. Johnson, Tulsa, Okla.

Filed Dec. 17, 1973, Ser. No. 425,147
Int. Cl.² B25B *13/16*
U.S. Cl. 81—165 **4 Claims**



1. An adjustable ratcheting wrench comprising:

a wrench body having a handle portion extending therefrom and a fixed jaw, the fixed jaw having a planar working surface;

a movable jaw slidably supported to said wrench body, the movable jaw having a planar working surface parallel said fixed jaw working surface, the planar working surfaces being variably spaced by the movement of said movable jaw to receive and engage the opposed parallel sides of rotatable members therebeteen;

one of the jaws having a notch formed in the outer end of the working surface, the notch having an inner surface which intersects the jaw working surface at an angle of about 40°, and an outer surface the plane of which intersects the plane of the opposite jaw working surface in the direction opposite the wrench body, the inner and outer surfaces of said notch intersecting each other at an angle of about 115°;

the other jaw having a backup surface at the outer end of the planar working surface, the backup surface including two planar portions, the first backup surface planar portion intersecting the jaw planar working surface at an angle of about 15°, the second backup surface planar portion intersecting the first portion at an angle relative to the plane of the jaw working surface of about 25°; and

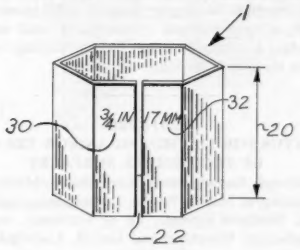
means of retaining said movable jaw in selectable spacings relative to said fixed jaw.

3,916,736

IDENTIFIED WRENCH ADAPTOR

James D. Clemens, 13967 Marquesas Way, Box 24, Marina del Rey, Calif. 90291

Continuation-in-part of Ser. No. 415,140, Nov. 12, 1973, abandoned. This application Aug. 26, 1974, Ser. No. 500,672
Int. Cl.² B25B *13/58*
U.S. Cl. 81—185 **4 Claims**



1. A wrench size-reducing adaptor for reducing the torquing surface of a wrench to make the wrench effective to apply torque to a member to be turned which has a wrenching surface that is normally too small to be turned by the wrench comprising:

a resilient, single-piece, split-ring formed with a thickness defining outer and inner periphery patterns to fit a specific size wrench and a specific size member to be turned respectively, said split ring being formed so as to tend to expand outwardly with force against the inner periphery of an oversized wrench when the adaptor is forced into said wrench to hold it securely therein, and

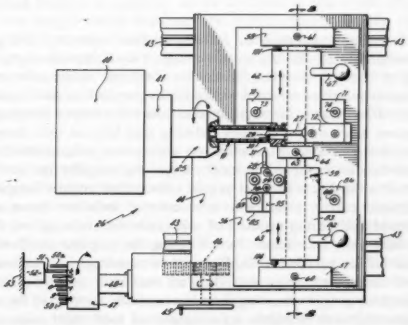
means affixed to said ring identifying the specific sizes of said outer and inner periphery patterns of said ring.

3,916,737

APPARATUS FOR MANUFACTURING A BELLOWS SEALS

Henry J. Libicki, Lorain, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Filed Oct. 3, 1972, Ser. No. 294,579
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² B23B *3/28*
U.S. Cl. 82—11 **7 Claims**



1. Apparatus for manufacturing a thin walled flexible bellows having multiple convolutions along the axial length of said bellows, said apparatus comprising

means for rotating a tubular workpiece blank having an inside wall surface and an outside wall surface,

cutting means for sequentially machining a first generally V-shaped groove into one of said surfaces of said tubular blank and a second generally V-shaped groove into the other of said surfaces, said grooves being axially spaced a distance equal to approximately one half the pitch of said convolutions, and

stop means for repeatedly and sequentially repositioning said cutting means at distances axially spaced through increments of one pitch diameter of said convolutions so as to enable said cutting means to alternately and sequentially machine V-shaped grooves throughout the axial length of said multiple convolutions, said stop means including a rotatable drum having varying length stop means mounted thereon.

3,916,738
APPARATUS FOR MACHINING AND/OR TREATMENT OF TROCHOIDAL SURFACES

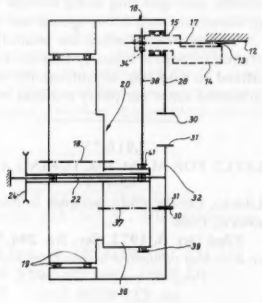
Paul Neubrand, Ludwigsburg; Karl Glaser, Markgroningen-Unterriexingen; Martin Prater, Ludwigsburg, and Siegfried Schmid, Stuttgart-Kemnat, all of Germany, assignors to Ludwigsburger Maschinenbau GmbH, Ludwigsburg, Germany

Filed Mar. 26, 1974, Ser. No. 454,795

Claims priority, application Germany, Mar. 30, 1973, 2315856; Jan. 22, 1974, 2402763

Int. Cl.[2] B23B *41/04;* **B24B** *7/00;* **B23B** *39/00*

U.S. Cl. 82—18 **32 Claims**



1. In an apparatus for moving at least one tool along a trochoidal path having a system axis, a combination comprising a control member; a carrier rotatable relative to said control member about a second axis parallel to said system axis; drive means for rotating said control member about said system axis and for thereby orbiting said second axis along a circular path having its center on said system axis; at least one tool holder mounted in said carrier for angular movement about a third axis parallel to said system axis; means for rotating said carrier relative to said control member about said second axis during rotation of said control member about said system axis; and means for changing the angular position of said holder relative to said carrier in response to rotation of said control member, including an eccentric on said control member, a rigid orienting member turnably supported by said eccentric and movable transversely of said third axis, and guide means for preventing angular movements of said holder relative to said orienting member, said guide means comprising a channel provided in said holder and reciprocably receiving said orienting member.

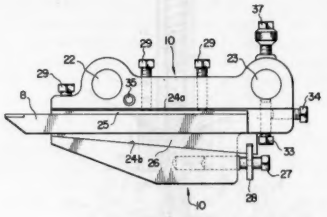
3,916,739
TOOL HOLDER

Takayuki Nomura, Tanazawa 437, Okutamamachi, Nishitamagun, Tokyo, Japan

Filed July 19, 1973, Ser. No. 380,691

Int. Cl.[2] B23B *29/00;* **B26D** *1/00*

U.S. Cl. 82—36 **5 Claims**



1. A tool holder adapted for mounting on a cutting tool rest comprising:

a. a main body portion;

b. first and second parallel attaching pins affixed to said tool rest a predetermined distance apart;

c. first and second holes in said body portion spaced apart said predetermined distance and adapted to receive said attaching pins, said holes allowing a fit tolerance of high accuracy with respect to said attaching pins;

d. means for locking said first and second attaching pins in said pin holes and wherein said means for locking said second attaching pin comprises a first adjusting bolt fitted into said second attaching pin and a second adjusting bolt fitted into said second hole by movement in a direction diametrically opposed to the direction of movement of said first adjusting bolt; and

e. means for securing cutting tools to said tool holder including a channel in said main body portion, said channel having a first wall surface and a second wall surface which is inclined with respect to said first wall surface, wherein said first wall surface extends along the longitudinal axis of said channel and is parallel to a line connecting the centers of said first and second holes.

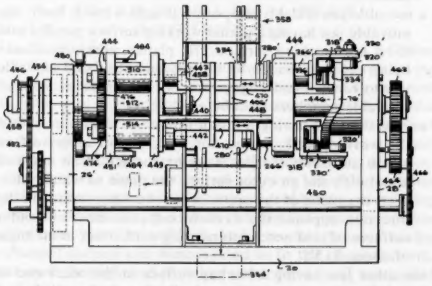
3,916,740
CAN TRIMMING APPARATUS

Alphonse Stroobants, Rte. 1, Forest, Va. 24502

Division of Ser. No. 492,860, July 29, 1974. This application Feb. 28, 1975, Ser. No. 554,329

Int. Cl.[2] B23B *5/14*

U.S. Cl. 82—56 **2 Claims**



1. A can end trimmer apparatus for trimming the open cylindrical end of a cylindrical can having a closed opposite base end, said appratus comprising a fixed main frame, main shaft means supported for rotation on said fixed main frame, means including a central rotary cutter knife positioned coaxi-

ally of said main shaft means, first and second rotary planetary knife members each having a circular cutting edge positioned adjacent said central rotary knife, support means carrying said first and second rotary planetary knife members for orbital movement about said central rotary knife, selectively operable knife actuator means for moving said first and second rotary planetary knife members between a first or cutting knife position in which said circular cutting edges of said rotary planetary knives overlap the cutting edge of the central rotary cutter knife and a second or non-cutting knife position in which said cutting edges are spaced apart and do not overlap, power transmission means drivingly connected to said first and second rotary planetary knives for enabling axial rotation of said planetary knives, drive means for drivingly rotating said main shaft means, a source of power drivingly engaged with said power transmission means when said cutter unit assembly is in said operative position for driving said rotary planetary knife members, can holder means mounted on said main shaft facingly adjacent said cutter means for movement between a first holder position in which a can supported by its base end on said can holder has its open end spaced from said knife members and a second holder position in which the open end of a can on said holder encloses one of said planetary knife members with a portion of the can wall extending between said rotary planetary knife member when said planetary knife is in said second or non-cutting position, cyclically operated knife control means engageable with said knife actuator means for causing said knife actuator to position said second planetary knives in either said first or second knife positions during desired discrete portions of each revolution of said main shaft and cyclically operated can holder positioning means operated in fixed timed relationship with said cyclically operated knife control means for moving said can holder to said second holder position at a time a planetary knife aligned with said holder is in said second or non-cutting knife position and retaining said holder in said second holder position while said aligned planetary knife first moves to said first or cutting knife position to effect cutting of an end portion of any can in the can holder from the remainder of the can and then moves back to said second or non-cutting knife position and for moving said can holder to said first holder position subsequent to said last-mentioned movement of said aligned planetary knife to said second or non-cutting position.

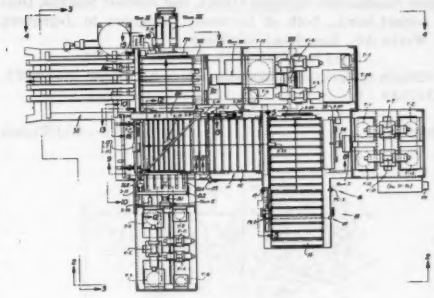
3,916,741

METHOD FOR CUTTING AND HANDLING BLOCK-LIKE ARTICLES

Alfred E. Comstock, Frontenac, Minn., and Burdsal Wilcox, Oakland, Calif., assignors to Safeway Stores, Incorporated, Oakland, Calif.

Continuation of Ser. No. 780,009, Nov. 29, 1968, which is a division of Ser. No. 402,746, Oct. 9, 1964, Pat. No. 3,433,278.
This application June 26, 1970, Ser. No. 56,072
Int. Cl. B26d *7/063n, 3/24, 7/18*
U.S. Cl. 83—27 **10 Claims**

1. In a method for cutting a succession of separate articles of random sizes with a plurality of cutting elements, each article having at least one exterior dimension which varies from article to article, the steps of: measuring said one exterior dimension of each article in succession, adjusting the spacing between the plurality of cutting elements into spaced-apart relationships while simultaneously measuring said dimension so that the spacing between the cutting elements is proportioned to said dimension; and, causing relative movement between the article and cutting elements to cut the



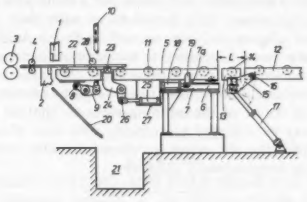
article into separate slices each having a dimension proportional to said exterior dimension.

3,916,742

SHEET CUTTING

Oskar Karl Biernot, Ensheimer Str. 34, 667 St. Ingbert, Saar, Germany

Filed Dec. 17, 1973, Ser. No. 425,539
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.[2] B26D *7/16*
U.S. Cl. 83—27 **5 Claims**



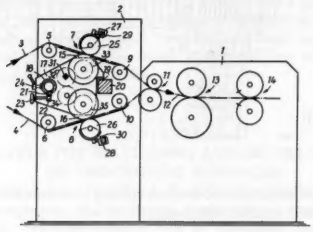
1. A method of cutting a sheet into sections of predetermined length, comprising advancing the sheet longitudinally between cross cutting shears until and actual length of sheet not greater than said predetermined length is located downstream of said shears and rests on a longitudinally displaceable tilting table, automatically comparing said predetermined and actual lengths to produce an error signal in the event of the actual length being less than the predetermined length, and, on occurrence of an error signal, clamping the sheet on the tilting table and displacing the tilting table longitudinally away from the cross cutting shears until the actual length coincides with the predetermined length whereupon the shears are operated to cut the section of predetermined length from the sheet.

2. Apparatus for cutting a sheet into sections of predetermined length, comprising a pair of cross cutting shears, a longitudinally displaceable tilting table downstream of said shears, a bed of driven rollers on said table, drive means for advancing said sheet between said shears and onto said table in a first feed step, means for measuring the actual length of sheet extending downstream of the shears after said first feed step, comparison means for comparing the measured actual length with said predetermined length, clamping means for clamping the sheet onto said table in the event of an error signal from said comparison means, and drive means for displacing the table longitudinally so as to perform a second feed step of the sheet after which said actual length coincides with the predetermined length.

3,916,743
APPARATUS AND PROCESS FOR SLITTING AT LEAST TWO WEBS

Peter Naudascher, Solingen-Ohligs, and Norbert Martini, Dusseldorf-Nord., both of Germany, assignors to Jagenberg Werke AG, Dusseldorf, Germany

Filed Nov. 21, 1973, Ser. No. 418,141
Claims priority, application Germany, Sept. 24, 1973, 2347889
Int. Cl.[2] B26D *7/06, 11/00*
U.S. Cl. 83—86 **3 Claims**

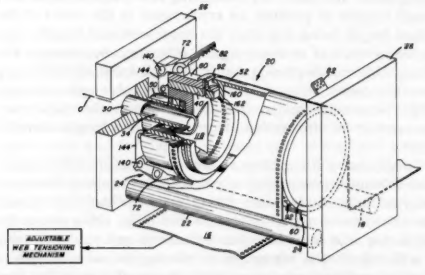


1. An apparatus for simultaneously slitting at least two initially separated continuously running webs such as paper comprising a plurality of pairs of circular knives, a support, one knife of each pair being in a fixed plane, the second knife of each pair being disposed on said support which is displaceable transverse to the running webs to move said second knives simultaneously toward or away from their respective first knives, roll means for guiding at least one of said webs to each of said knife pairs, and means for joining said slit webs superimposed across their broad faces with their edges in longitudinal alignment, one second knife on said support being fixed in position relative to said support and one second knife on said support being displaceable along the axis about which the second knife rotates in a direction transverse to the direction of travel of the running webs so that its plane of rotation may be adjusted to coincide with that of said fixed second knife, the slit edges produced by said two second knives being longitudinally aligned.

3,916,744
ROTARY WEB PERFORATING APPARATUS

Henry L. West, 1669 Lake Ave., Rochester, N.Y. 14650

Filed May 2, 1973, Ser. No. 356,689
Int. Cl. B26f *1/08*
U.S. Cl. 83—175 **15 Claims**



1. In a rotary web perforating apparatus, the combination comprising:

a support member;

a shaft extending through and journaled for rotation within said support member;

a web supporting drum secured to said shaft and mounted on bearings interposed between said support member and said drum for concentric rotation and transport of said web;

web perforating means mounted on said drum for rotation therewith and movable between a retracted position displaced from said web and a perforating position for perforating said web;

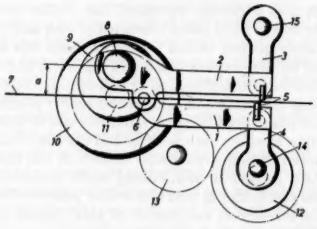
cam means on said support member eccentric to said shaft; and

ring means encircling said cam means and mounted for rotation thereon, and secured to said web perforating means for moving said web perforating means between said retracted and perforating positions upon rotation of said shaft for continuously perforating said web transported on said drum.

3,916,745
CUTTING ARRANGEMENT

Harald Strohmeier, and Günter Müller, both of Kapfenberg, Austria, assignors to Vereinigte Edelstahlwerke AG, Vienna, Austria

Filed May 15, 1974, Ser. No. 470,297
Claims priority, application Austria, May 18, 1973, 4352/73
Int. Cl.[2] B23D *25/02, 25/06*
U.S. Cl. 83—311 **3 Claims**



1. A cutting device for cutting sections of equal length of strand material and in particular wire continuously moving in a longitudinal path, comprising in combination,

a pair of members pivotally connected to each other at one of their ends and each having knive means secured to the other free end, said pair of members being adapted to move in substantially parallel paths relative to the path of movement of said strand material;

one member having a portion extending from the pivot point of the pivotal connection between said pair of members away from the free end thereof;

a first crank gear rotatably mounted in said device;

a first crank shaft rotatably mounted in said crank gear and in said extending portion for operatively connecting them;

a pair of pivotable guide members mounted at opposite sides of said pair of members and extending substantially normal to the said longitudinal path of movement of the strand material, each guide member being pivotally connected at one of their ends to one of said members;

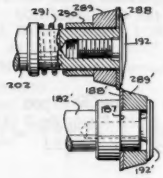
a second crank gear rotatably mounted in said device and operatively connected to said first crank gear so that both crank gears move at equal rotational speeds; and

a second crank shaft rotatably mounted in one of said guide members, at a point distant from said pivotal connection with said member, and in said second crank gear for operatively connecting them.

3,916,746
CAN TRIMMING APPARATUS

Alphonse Stroobants, Rte. 1, Forest, Va. 24502

Division of Ser. No. 492,860, July 29, 1974, abandoned. This application Feb. 28, 1975, Ser. No. 554,330
Int. Cl.² B26D 1/28
U.S. Cl. 83—666 1 Claim

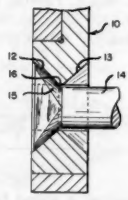


1. Rotary cutting means usuable with a like manner as a cutting couple comprising:
- a cutter shaft portion having an outer end surface extending radially with respect to its axis,
- removable flange means mounted on said cutter shaft portion defining a radial abutment flange surface extending radially outwardly adjacent the outer end surface of the cutter shaft portion,
- a rotary knife member formed of a relatively thin cutter disc having planar sides the outer periphery of which define first and second peripheral cutting edges and an axial aperture matingly received over said cutter shaft portion, a slide sleeve including a radial surface facing said abutment flange surface mounted on said cutter shaft for axial reciprocation with respect thereto, said relatively thin cutter disc being positioned between the radial surface of the slide sleeve and the abutment flange surface; and
- biassing means for urging said slide sleeve toward said removable flange means so that one of said planar sides of said relatively thin cutter disc is positively and accurately positioned against said abutment flange to provide an accurate positioning of the cutting edge defining the outer periphery of the planar side engaging the abutment flange surface.

3,916,747
SHEAR KNIVES AND HOLDING MEANS THEREFOR

C. Wesley Murray, Pittsburgh, Pa., assignor to Midvale-Heppenstall Company, Pittsburgh, Pa.

Filed June 12, 1974, Ser. No. 478,624
Int. Cl.² B26D 1/00, 7/26
U.S. Cl. 83—698 4 Claims

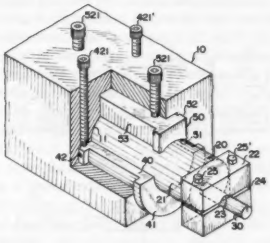


1. An elongated shear knife of generally rectangular form having a plurality of spaced openings through said knife intermediate its width from one end to another, each said opening being provided with a like countersunk portion at each end separated by a land defining an elongated pass through portion and fastener means having an elongated stem portion and a frusto conical head, said head being cut away at opposite sides to pass through the elongated pass through portion of the openings in said sheer knife, the two ends of said shear knife being provided with a longitudinally extending opening receiving a lifting lug.

3,916,748
PUNCH ASSEMBLY

Yuan-Ho Lee, No. 85, Jen Ho Road, Tainan, China /Taiwan

Filed May 29, 1974, Ser. No. 474,219
Int. Cl.² B26F 1/14; B23B 31/06
U.S. Cl. 83—699 4 Claims

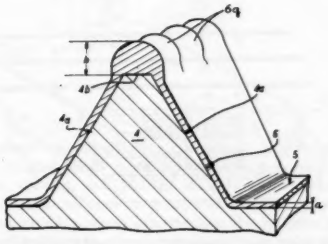


1. A punch mounting assembly and ram for use with a nut forming machine or the like comprising: a cylindrical bore formed in said ram; a semi-cylindrical seat rotatably mounted in said bore; means defining a semi-cylindrical cavity in said seat; the diameter of said semi-cylindrical cavity being less than that of said seat, the axes of said cavity and seat being essentially parallel but not coincident whereby said seat is crescent shaped in cross-section; a cylindrical punch holder mounted in said cavity, and means for mounting a punch on said punch holder on an axis essentially parallel to but non-coincident with said axes of said cavity and seat whereby said punch may be adjusted in said ram within a plane normal to the axes of said cavity and seat by independent rotation of said seat and said cylindrical punch holder.

3,916,749
ROTARY CUTTING AND FOLD MARKING TOOL

Georges Edouard Armelin, 6, rue Auguste Rodin, La Source, Orleans, France (45018)

Filed June 5, 1973, Ser. No. 367,250
Int. Cl.² B26D 1/36
U.S. Cl. 83—835 4 Claims

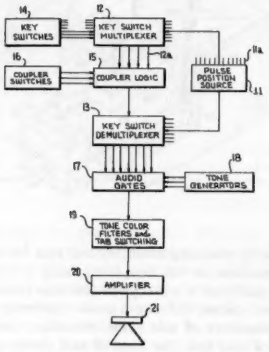


1. A tool comprising:
- a. a generally cylindrical core having means defining a projecting peripheral tooth on an outer surface of said core and extending longitudinally thereof; and
- b. a metallic wear-resistant layer disposed on said projecting tooth and having a portion having a varying thickness defining a plurality of generally hemispherical serrations jointly defining a serrated edge along a crest of said projecting tooth and extending longitudinally of said tooth.

3,916,750
ELECTRONIC ORGAN EMPLOYING TIME POSITION MULTIPLEXED SIGNALS

Dale M. Uetrecht, Cincinnati, Ohio, assignor to D. H. Baldwin Company, Cincinnati, Ohio

Division of Ser. No. 223,629, Feb. 4, 1972, Pat. No. 3,746,773.
This application July 3, 1973, Ser. No. 376,189
The portion of the term of this patent subsequent to July 17, 1990, has been disclaimed.
Int. Cl.[2] G10H *1/00*
U.S. Cl. 84—1.01 6 Claims

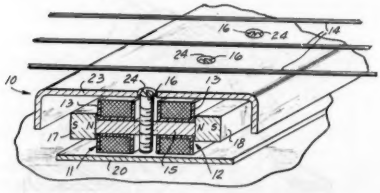


1. In a multiplex organ system, a key switch for each note of a multi-octave manual, means for converting actuated ones of the keys of each octave of said manual separately into only 12 pulse codings in concurrent octaval note frames which occur in common for the separate octaves, and means for converting the codings of said pulses to tones of said organ.

3,916,751
ELECTRICAL PICKUP FOR A STRINGED MUSICAL INSTRUMENT

Willi Lorenz Stich, Antioch, Tenn., assignor to Norlin Music, Inc., Lincolnwood, Ill.

Filed Jan. 9, 1975, Ser. No. 539,650
Int. Cl.[2] G10H *3/08*
U.S. Cl. 84—1.15 9 Claims



1. An electrical pickup for a stringed musical instrument, comprising:

a. a pair of axially spaced coils arranged to have their axes extend along the length of an instrument string;

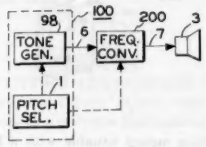
b. a ferromagnetic pole piece spanning the space between said coils and extending into each of said coils, said pole piece having a portion between said coils extending toward the string; and

c. permanent magnet means having a pole face directed toward said pole piece, and directing a magnetic field into said pole piece of a single magnetic polarity.

3,916,752
FREQUENCY CONVERSION SYSTEM FOR AN ELECTRONIC MUSICAL INSTRUMENT

Kinji Kawamoto, Neyagawa; Masahiko Tsunoo, Osaka, and Masuo Omura, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 865,030, Oct. 9, 1969, abandoned.
This application Aug. 27, 1971, Ser. No. 175,714
Claims priority, application Japan, Oct. 21, 1968, 43-77565
Int. Cl.[2] G10H *3/00*
U.S. Cl. 84—1.19 7 Claims



1. A frequency conversion system for an electronic musical instrument comprising;

a signal source composed of at least one biased tone generator which is detuned from a normal musical scale by a predetermined frequency difference ΔfHz in a predetermined direction for generating a first tone signal having a first fundamental frequency component which is biased from said normal musical scale by said frequency difference ΔfHz in said direction and which also has exact harmonic components the frequencies of which are a positive integer multiple of the frequency of said first fundamental frequency;

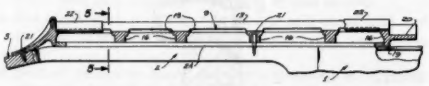
at least one frequency converter connected to said signal source for changing all the frequency components of said first tone signal in a direction the opposite of said predetermined direction by a converting frequency equal to said predetermined frequency difference ΔfHz in order to produce a converted tone signal having frequency components consisting of a second fundamental frequency component and inexact harmonics thereof, each of said second fundamental frequency component and said inexact harmonics having a changed frequency which differs from said first fundamental frequency component and said exact harmonics of said first tone signal by said converting frequency ΔfHz of said frequency converter; and

an electro-acoustic transducer connected to said at least one frequency converter.

3,916,753
GUITAR CONVERSION

Walter E. Smith, P.O. Box A, Payette, Idaho 83661

Filed June 13, 1974, Ser. No. 478,860
Int. Cl.[2] G10D *1/08*
U.S. Cl. 84—267 6 Claims



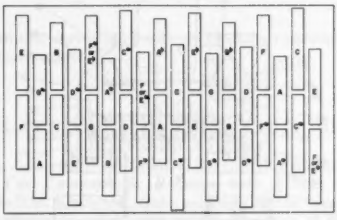
1. A guitar, comprising: a sound box, a neck having an original fret board thereon extending from the sound box and terminating in a head, the head having string tuning means; the neck presenting a surface essentially coplanar with the front of the sound box; a single piece conversion member including a front wall having a substitute fret board thereon disposed in angular relation to the original fret board and engaging the lower margin thereof, an edge flange at the upper side of the front wall engaging the upper margin of the orginal fret board, the conversion member forming with the original

fret board, a longitudinally extending resonating chamber, and a string receiving nut adjacent the head; a bridge having a string receiving edge in essentially parallel relation with the substitute fret board; a string anchor on the front side of the sound box; and a set of strings extending from the anchor across the bridge over the substitute fret board, across the nut and joined to the tuning means.

3,916,754
MUSICAL INSTRUMENT FOR CHORD ACCOMPANIMENT

Wilhelm M. Thiel, Mainz, Germany, assignor to Danielle Deis, Bischofsheim, Germany

Filed Dec. 30, 1974, Ser. No. 537,182
Int. Cl.[2] G10C *3/12*; **G10D** *13/08*
U.S. Cl. 84—402 **2 Claims**



1. A musical instrument for chord accompaniment comprising a plurality of tone producing means, said tone producing means arranged in axially aligned pairs which paired means produce tones one-half musical interval apart, a plurality of said pairs being transversely arranged in offset side by side relationship such that one member of each pair is adjacent both members of the flanking pairs, said transversely arranged pairs being in an ordered series so that the tone producing means are alternately arranged a double whole musical interval and one and one-half musical interval apart on an ascending scale.

3,916,755
DRIVE FASTENER FOR INSERTION INTO SHEET MATERIAL

John A. Pestka, Parkridge, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

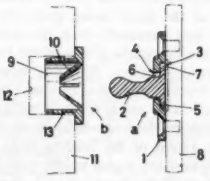
Filed Apr. 3, 1974, Ser. No. 457,428
Int. Cl.[2] F16B *21/08*
U.S. Cl. 85—5 R **2 Claims**

1. A drive fastener for insertion into a sheet material workpiece having one or more apertures of a predetermined diameter, said fastener including first and second generally flat wall sections formed of a sheet metal stamping tied together at one end thereof to be bent upon itself to form a nose end for the drive fastener with said flat wall sections in adjacent opposing spaced relation to one another at said nose end and converging toward one another towards their opposite ends, each of said flat wall sections having the lateral edges thereof diverging from said nose end to a neck portion, a lateral projecting shoulder formed at an upper end of one of the lateral edges of each flat wall section, the transverse dimension measured from said shoulder to its opposite diverging edge being equal to or greater than said predetermined diameter, the lateral projecting shoulder of one flat wall section being on the opposite side as the lataeral projecting shoulder formed on the other flat wall section, each lateral peojecting shoulder and its associated diverging edges extend laterally beyond the adjacent diverging edge of the other flat wall section, a head portion extending longitudinally and laterally from each said neck portion to overlie the peripheral portion about said aperture, said head portions each including a pair of oppositely extending planar elements angularly disposed so that the terminating edges of said head portion are in contact with the terminating edges of the opposite head portions attached to the other neck portion, and resilient U-shaped rib means formed longitudinally along and in each of said flat wall sections, said neck portions, and said head portions, said U-shaped rib sections at their oppositely extending bight portions having a lateral extent equal to or greater than the predetermined diameter of the aperture and engaging said aperture at diametral points to assure positive contact, the sides of each of said U-shaped rib sections being movable toward one another to enable temporary laterally inward movement of said diverging edges, neck portions and head portions during insertion of said drive fastener into an aperture, and thereafter returning substantially to its original configuration with the lateral edges of said neck portion and the bight portion of the rib means engaging the inner periphery of the aperture in quadrature arrangement, said head and laterally projecting shoulder portions engaging the material immediately adjacent the aperture on opposite sides of the sheet material workpiece.

3,916,756
COUPLING DEVICE

Tohru Yoda, Yokohama, Japan, assignor to Nifco Inc., Tokyo, Japan

Filed Feb. 21, 1974, Ser. No. 444,448
Claims priority, application Japan, Feb. 24, 1973, 48-23263[U]
Int. Cl.[2] F16B *21/07*
U.S. Cl. 85—8.8 **1 Claim**



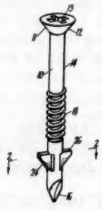
1. A plastic coupling device comprising: a male member having a headed shank portion and a collar portion at the other end thereof, said headed shank portion including a bulbous head connected to a reduced diameter portion to provide an annular recess intermediate the bulbous portion and said collar portion, a base plate having a raised portion on one major surface and a recessed portion on the other major surface thereof, said raised portion having an aperture at its center, the diameter of said annular recess on said headed shank portion as well as said bulbous head being smaller than the diameter of said aperture and the diameter of said collar portion being smaller than the diameter of said recessed portion but larger than said aperture to thereby permit said male member to move freely in all directions relative to said base plate and compensate for misalignment with a mating female member, said female member generally formed in the shape

of an open ended hollow cylinder with a rigid annular laterally outwardly extending collar portion integrally connected to the periphery of one open end thereof, a plurality of resilient tabs formed integral with and on the other periphery of said cylinder spaced axially from said annular collar portion and converging toward the other open end in the hollow space of the cylinder, said tabs forming a split frustoconical section having a wall thickness less than the thickness of the annular collar portion whereby said tabs are capable of flexing independently of the hollow cylinder forming the female member, said hollow cylinder having a plurality of integral circumferentially spaced ramp-like projections adjacent the said other open end and adapted to engage the wall of a hollow bore adapted to accept said cylindrical female member, said member capable of independent flexing from the flexing of said tabs whereby insertion of the headed member into the female member will not disturb the cooperation between the female member and the blind bore in which it is mounted.

3,916,757
FASTENERS

Robert Neil Wilson, Surrey Hills, Australia, assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Oct. 23, 1974, Ser. No. 517,348
Claims priority, application Australia, Oct. 30, 1973, 5458/73
Int. Cl.² F16B *25/00*
U.S. Cl. 85—43 **6 Claims**



1. A fastener having a shank, a head at one end of said shank and an entry portion at the other end of said shank, a threaded portion intermediate the entry portion and the head, the undersurface of the head being generally frustoconical tapering upwardly and outwardly from the shank at a predetermined angle to the longitudinal axis of the fastener, at least one wing-like cutting member frangibly connected to the shank including a leading edge and trailing edge, the leading edge being disposed at an angle to the longitudinal axis substantially equal to the predetermined angle of the head undersurface, the radial extent of the leading edge of the cutting member being substantially equal to the radial extent of the tapered undersurface of the head, wherein the cutting member is capable of forming a countersunk recess in a workpiece complementary to the head configuration.

3,916,758
UNIVERSAL CARTRIDGE HOLDER

Clifford L. Ashbrook, 509 Rhapsody, San Antonio, Tex. 78216

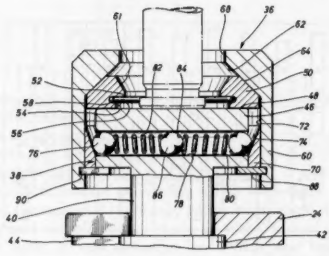
Filed June 15, 1973, Ser. No. 370,211
Int. Cl.² F42B *5/26, 9/26*
U.S. Cl. 86—49 **6 Claims**

1. A universal cartridge holder for supporting cartridge cases having a rim disposed at one extremity thereof, said cartridge holder comprising:

base means having one extremity thereof defining a support surface for a cartridge to be supported by said holder and resisting the forces applied to said cartridge in one direction during cartridge loading operations;

segmented cartridge rim engaging means including a plurality of segments being disposed adjacent said base means and being oriented in generally circular relationship, said segments being movable radially inwardly to a cartridge gripping position, where each of said segments engage the rim of the cartridge and being movable radially outwardly to a released position, where said segments are retracted from the rim of the cartridge, each of said segments having inner and outer cam surface means formed thereon, said rim of said cartridge reacting against said inner cam surface means as said cartridge is inserted into said cartridge holder to cause radially outward movement of said segments;

means for continuously urging said segmented rim engaging means radially outwardly toward the released position thereof;



a housing being disposed in relatively movable relation about said base means and having an internal cam surface formed therein, said cam surface engaging said outer cam surfaces of said plurality of segments and, upon moving linearly toward said base means, overcoming said continuously urging means and imparting radially inward movement to said segments from the released position thereof to the gripping position thereof;

second cam means being located within said housing;

means located on said base means and imparting a force to said second cam means and urging said housing in a linear direction causing said internal cam surface to react with said outer cam surface means of said segmented rim engaging means and urge said rim engaging means radially inwardly toward the cartridge gripping position thereof; and

urging said housing in one linear direction relative to said base means.

3,916,759
ROCKET LAUNCHER

Bernard M. Jones; Robert H. Forster; Gaylon L. West; Donald G. Quist, and Harry C. Loyal, all of China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 29, 1968, Ser. No. 772,070
Int. Cl.² F41F *3/04*
U.S. Cl. 89—1.814 **7 Claims**

1. A lightweight easily portable rocket launcher comprising:

a lightweight sheet metal housing having two opposing side walls and a peripheral wall;

at least one launcher tube protruding slightly through one side wall of said housing and also protruding to a greater degree through the opposite side wall of said housing;

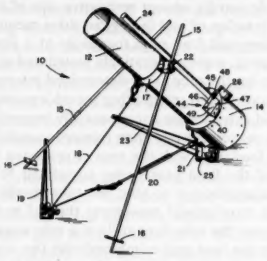
contact means associated with each said tube for conduction of electrical energy to a rocket round;

a source of electrical energy;

timer means electrically connected to each said launcher tube and to said source of electrical energy;

said timer means including a settable clockwork switch and

an electronic delay timer switch connected in series with said source and said contact means; and



removable means for positively blocking operation of said timer means.

3,916,760

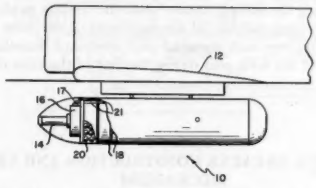
AIRCRAFT CARRIED CONSTANT DENSITY MUNITION DISPENSING SYSTEM

Clinton J. Sewell, Washington, D.C.; Guy H. Frindell, Columbia; Carl Campagnuolo, Potomac, both of Md., and Paul Vollbracht, Cincinnati, Ohio, assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 240,415, April 3, 1972, abandoned. This application Jan. 14, 1974, Ser. No. 433,176

Int. Cl.[2] B64D *1/06*

U.S. Cl. 89—1.5 E **12 Claims**



1. An aircraft munitions dispensing system adapted for ejecting munitions at selectable intervals maintained independently of aircraft speed comprising:

a dispenser adapted to be attached to the aircraft;

a plurality of munition containers positioned in said dispenser;

a velocity-discriminating, air-driven generator positioned in said dispenser for producing an a.c. voltage proportional to aircraft speed;

a firing control system connected to said generator including:

an electronic package responsive to said generator for producing a series of pulses with frequency proportional to aircraft speed comprising:

a rectifier circuit connected to said generator for converting the a.c. voltage to a d.c. voltage proportional to aircraft speed; and

a voltage-controlled oscillator circuit connected to said rectifier circuit for producing output pulses with frequency proportional to aircraft speed; and

pulse distribution means to control ejection of the individual munition containers; and

ejection means positioned adjacent said munition containers responsive to said firing control system for forcibly ejecting said containers from said dispenser package.

3,916,761

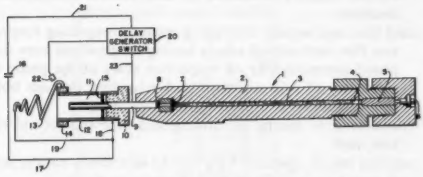
TWO STAGE LIGHT GAS-PLASMA PROJECTILE ACCELERATOR

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Edward L. Shriver, Huntsville; David W. Jex, Guntersville, both of Ala., and Eduard B. Igenbergs, Munich, Germany

Filed Jan. 29, 1974, Ser. No. 438,147

Int. Cl.[2] F41F *1/04*

U.S. Cl. 89—8 **8 Claims**



1. A device for accelerating a projectile to a high velocity, comprising:

a light gas accelerator, including a barrel, for imparting an initial velocity to said projectile;

a plasma generator adapted to receive said projectile from said barrel, said plasma generator being of the type having a pair of coaxial electrodes, said barrel extending into said generator so as to constitute the center electrode thereof;

means for initiating the generation of said plasma when said projectile is in a preselected location in said generator; and,

means for controlling the flow of said plasma in a manner so as to accelerate said projectile to velocities higher than the initial velocity.

3,916,762

TWIN FEED AMMUNITION CONVEYOR FOR FEEDING SHELLS TO AN AUTOMATIC WEAPON

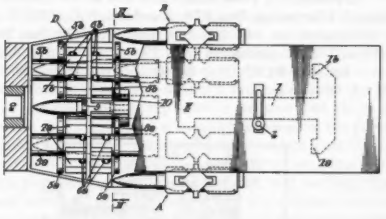
Bernard Pierre, Lyon; Rene Volle, Bourges, and Georges Simon, St-Germain-du-Puy, all of France, assignors to Etat Francais, Paris, France

Filed Mar. 25, 1974, Ser. No. 454,760

Claims priority, application France, Apr. 3, 1973, 73.11865

Int. Cl.[2] F41D *9/02*

U.S. Cl. 89—33 SF **5 Claims**



1. A twin feed ammunition conveyor for feeding shells to a shell chamber of an automatic weapon, such conveyor including:

a structure having a longitudinal plane of symmetry;

means defining in said structure an extraction station for receiving on respective sides of the plane of symmetry of said structure first and second strips of shells in which the shells are retained by shackles;

means operative at said extraction station for individually separating the shells of the first and second strips from their shackles by a longitudinal forward displacement of the shells;

means defining in said structure a distribution station disposed forwardly of said extraction station;

said distribution station having a central introduction location from which the shells are fed to the shell chamber of the weapon, and first and second standby locations disposed symmetrically on respective sides of said central introduction location for receiving shells displaced forwardly from said extraction station;

first and second conveying means in said distribution station for transferring shells respectively from said first and second standby locations to said central introduction location;

said first and second conveying means comprising respective first and second rotors having longitudinal axes disposed symmetrically on respective sides of the plane of symmetry of said structure and extending through both said extraction and distribution stations;

common drive means for driving said first and second rotors; and

selector means operable by a user to selectively couple said first and second rotors to said common drive;

in which ammunition conveyor the improvement comprises said first and second conveying means further comprising:

at least one star wheel having 2n teeth on each of said first and second rotors for transferring a shell from said first and second standby locations respectively towards the central introduction location;

at least one set of n radially extending pushers on each of said first and second rotors;

each said pusher being keyed angularly to the respective rotor and being slidable in the radial direction;

first and second control cams defined in said structure in said distribution station for imparting a radial sliding movement to said pushers on rotation of said first and second rotors respectively; and

a shoe on each end of each said pusher for following the respective control cam over one portion of the rotation of the respective rotor;

each said shoe being operative, over another portion of the rotation of the respective rotor, to engage a shell being transferred towards the central introduction location by the respective star wheel to positively introduce the shell into the central introduction location where the shell is retained by said shoe and by the shoe of a pusher on the other rotor.

3,916,763

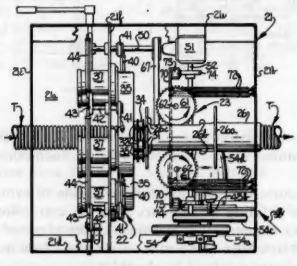
APPARATUS FOR FORMING SLITS IN TUBES

Ernest J. Maroschak, Box 878, Roseboro, N.C. 28382

Division of Ser. No. 271,379, July 13, 1972, Pat. No. 3,831,470. This application May 29, 1974, Ser. No. 474,259

Int. Cl.[2] B23C *1/14;* **B23D** *25/16;* **B26D** *3/06*

U.S. Cl. 90—15.1 **1 Claim**



1. Apparatus for forming slits in a corrugated tube having annular corrugations of alternating ribs and valleys thereon, said apparatus comprising a slitting station having a plurality of normally inactive cutting blades, said slitting station also having means for feeding the corrugated tube therethrough comprising a rotary feed gear having peripheral teeth thereon adapted to successively enter successive valleys of the tube and to push forwardly against respective ribs of the tube during forward rotation of said feed gear, drive means for continuously rotating said feed gear forwardly at a predetermined peripheral speed, means operatively associated with said feed gear for stopping the tube at predetermined intervals of predetermined duration and comprising means operatively associated with said drive means for repeatedly imparting rearward translational movement and then forward translational movement to the feed gear with the rate of rearward translational movement of the feed gear being correlated to the rate of forward rotation thereof so that the tube dwells throughout the rearward translational movement thereof and so that the feed gear moves the tube forwardly at a rate equal to the rate of rotation of the feed gear combined with the rate of forward translational movement of the feed gear during each successive forward translational movement of the feed gear, means automatically operable during the course of each successive rearward translational movement of said feed gear for activating said cutting blades and moving the same into cutting engagement with the tube each time the tube dwells in its course through the slitting station, and an elongate tubular guide member extending through said slitting station and defining an encircling restricting passageway for directing the corrugated tube past said cutting blades and into meshing engagement with said feed gear, said tubular guide member having one end thereof positioned immediately adjacent to said cutting blades but out of cutting engagement therewith and serving for preventing any substantial displacement of the tube by said cutting blades during their movement into cutting engagement with the tube, and said tubular guide member having an elongate opening in the wall thereof adjacent to said feed gear through which the peripheral teeth of the feed gear extend for meshingly engaging with the corrugated tube and feeding the same through the slitting station while the tubular guide member prevents any substantial displacement of the tube by the feed gear during said forward and rearward translational movement of the feed gear during feeding of the tube through the slitting station.

3,916,764

CONCRETE BREAKER CONSTRUCTION AND VALVE MECHANISM

Stephen E. Crover, Boring, Oreg., assignor to Ackley Manufacturing Co., Clackamas, Oreg.

Filed Feb. 11, 1974, Ser. No. 441,110

Int. Cl.[2] F01B *7/18;* **F01L** *25/04*

U.S. Cl. 91—235 **7 Claims**

1. A fluid operated breaker particularly adapted to be employed for imparting repetitive blows to a tool to drive the tool into engagement with a surface comprising:

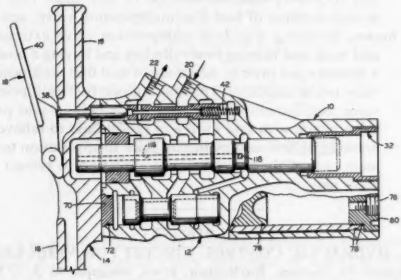
a. a breaker housing including inlet means and outlet means, said housing having a multiplicity of bores formed therein and means for mounting a tool member at one end thereof;

b. a piston supported in a first bore for movement therewithin alternately in a power stroke terminating with said piston adjacent said one end of said housing for imparting a blow to the associated tool and a return stroke terminating with said piston spaced from said one end of said housing, said piston having a stepped construction formed by a plurality of lands and grooves formed along the length of said piston providing a multiplicity generally radially extending shoulders, said shoulders providing a first force area facing towards said one end of said housing and a second force area facing oppositely from said one end with said second force area being larger than said first force area all said shoulders providing said force areas being spaced from the ends of said piston, and said housing and piston being cooperatively configured and

dimensioned to preclude fluid communication through said first bore between said shoulders comprising said force areas and the ends of said piston whereby the high pressure fluid acting on said shoulders of said piston effects movement in both power and return strokes.

c. switching means including a reversing valve spool having a stepped construction supported in a second bore for movement therewithin alternately between a first position and a second position operable to produce variation in the flow of fluid to said first bore and said second force effective area to cause said piston to alternately switch between movement in said power stroke and movement in said return stroke thereof;

d. fluid circuit means fluidically interconnecting said inlet means, said outlet means and said multiplicity of bores operable to provide alternate fluid flow paths therebetween, said fluid circuit means being operable when said reversing valve spool is in said first position thereof to establish a first flow path for high pressure fluid from said inlet means to said first bore to cause high pressure fluid to be applied against said first force area of said piston and a second flow path for high pressure fluid from said first bore to and from said second bore to cause high pressure fluid to be applied against said second force area of said piston with the resultant force produced by the high pressure fluid acting on said first and second force areas of said piston causing said piston to accelerate in said power stroke thereof, said second flow path for high



pressure fluid being cut off by said first force area of said piston as said piston moves in said power stroke thereof to cause the discontinuance of the flow of high pressure fluid against said second force area and thereby to terminate the force being provided by the high pressure fluid against said piston causing said piston to move in said power stroke thereof before said piston imparts a blow to the tool, said fluid circuit means in said second position of said reversing valve spool providing a first flow path for low pressure fluid from said first bore to said second bore to provide an exhaust path for low pressure fluid therebetween and a second flow path for low pressure fluid from said second bore to said outlet means to provide an exhaust path for low pressure fluid therebetween;

e. accumlator means in a third bore in said breaker housing fluidically interconnected by said fluid circuit means with said first bore and operable as a storage means for storing energy therein during said return stroke of said piston and for releasing the energy stored therein during said power stroke of said piston to increase the force with which said piston imparts a blow to the tool; and

f. variable restrictor means in one of said flow paths for low pressure fluid operable to vary the pressure in said low pressure fluid paths and thereby the pressure in the fluid circuit to said accumulator means to vary the energy stored therein during the return stroke of said piston.

3,916,765

AUTOMATIC CONTROL OF RAM-TYPE FLUID-PRESSURE OPERATED ACTUATOR UNITS

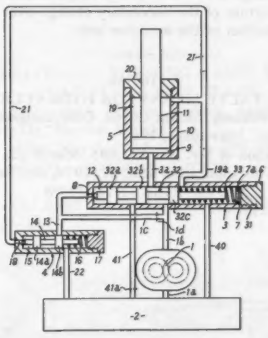
John Leslie Hilton, Ringwood, England, assignor to The Plessey Company Limited, Essex, England

Filed May 25, 1973, Ser. No. 364,157

Claims priority, application United Kingdom, May 31, 1972, 25474/72; May 31, 1972, 25475/72

Int. Cl.[2] F01L *25/06*

U.S. Cl. 91—307 **1 Claim**



1. Fluid-pressure-operated apparatus which comprises: an actuator unit having a working chamber and an output member movable, by pressure in said working chamber, to carry out a forward stroke in which the volume of said working chamber is increased, and which extends from a first position to a second position, and return means having a return chamber and operable by pressure in said return chamber to produce return movement of said output member towards said first position; change-over means including a main change-over valve and a secondary change-over valve, each constituted by a valve housing formed with a cylindrical bore having an access aperture at one end and with a plurality of ports spaced along said bore, by a valve spool longitudinally movable along said main bore between a first control position and a second control position and formed with a plurality of lands spaced longitudinally of the valve spool and including one land which throughout the movement of the spool isolates said access aperture from all said ports, and by a spring urging said valve spool to said first control position; the cylindrical bore of each change-over valve housing terminating at an end face that is perforated to provide said access aperture, the latter being of smaller diameter than and coaxial with said main bore and forming a valve seat at said end face, and the valve spool of each change-over valve having a reduced-diameter extension at one end constituting a valve element that closes said seat when said valve spool is in said first position, the ports of the main change-over valve including a supply port for connection to a supply of fluid under pressure, a first and a second service port respectively connected with said working chamber and with said return chamber, and low-pressure vent port means, said ports and port means being so arranged in relation to said lands that, when said valve spool is in said first control position, they establish communication between said first service port and said supply port while isolating the said first service port from the vent port means, and also establish communication between said second service port and the vent port means while isolating said second service port from said supply port, and that conversely, when the valve spool is in its second control position, they establish communication of said second service port with said supply port and isolate the second service port from the vent-port means, while also establishing communication of said first service port with the vent port means and isolating the first service port from the supply port, the ports of the secondary change-over valve including

a communication port and a vent port which are arranged at such positions spaced along the cylindrical housing bore as to be in communication with each other when the spool of the secondary change-over valve is in its second control position and are isolated from each other by one of the lands of the valve spool when said spool is in its first control position; passage means connecting the communication port of the secondary change-over valve with the valve seat in the end face of the bore of the housing of the main change-over valve and communicating through a restrictor with the supply port of the first change-over valve, and passage means connecting the access aperture of the secondary change-over valve with the return chamber of the actuator unit.

3,916,766

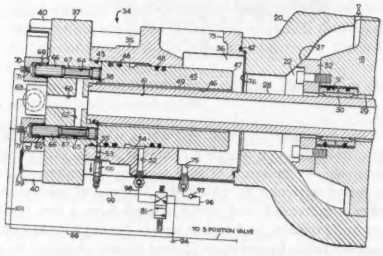
CONTROL VALVE MEANS FOR HYDRAULIC PRESS

Donald A. Huelskamp, Mount Gilead, Ohio, assignor to Koehring Company, Milwaukee, Wis.

Continuation of Ser. No. 237,085, March 22, 1972, abandoned. This application Mar. 27, 1974, Ser. No. 455,312

Int. Cl.[2] F15B *11/18, 13/06*

U.S. Cl. 91—411 A **1 Claim**



1. In a hydraulic press:

a main ram cylinder,

a main ram in said main ram cylinder and extendable to and retractable from a clamping position, said main ram having a rearwardly directed surface against which fluid pressure may act to extend said ram to its clamping position and a forwardly directed surface against which fluid pressure may act to retract said ram,

a booster ram cylinder in said main ram,

a hollow booster ram having a front end portion extending into said booster ram cylinder,

stationary support means connected to a rear end portion of said booster ram and having a first chamber therein communicating with the interior of said booster ram,

a source of prefill fluid,

a control valve body disposed in surrounding relationship to said booster ram in the zone between said main ram cylinder and said support means and having a fluid passage for communicating said source of prefill fluid with the interior of said main ram cylinder behind said main ram,

a prefill valve piston within said control valve body disposed in surrounding relationship to said booster ram and being movable between a first position in which said fluid passage is open and a second position in which said fluid passage is closed off to block the flow of prefill fluid between said main ram cylinder and said source of prefill fluid,

said stationary support means further including a generally cylindrical prefill pin chamber communicating intermediate the ends thereof with said first chamber in said stationary support means, communicating at its rear end with a pilot pressure port and communicating at its front end with the interior of said control valve body at a location in alignment with the path of movement of said prefill valve piston,

a one piece cylindrical prefill valve pin movably disposed in said chamber and comprising

a pilot pressure reaction surface at the rear end thereof, a surface at the front end thereof for engaging said prefill valve piston to urge the prefill valve piston toward its closed second position, and

a circumferentially grooved portion in the periphery of said cylindrical pin intermediate the ends thereof of such length as to remain in communication with said first chamber in said stationary means throughout the range of movement of said prefill valve pin and to communicate with the space behind said prefill valve piston when the prefill valve pin reaches its forwardmost position,

a source of pressurized pilot fluid and means for applying said pilot fluid to said pilot pressure reaction surface,

means defining a fluid passage from said space behind said prefill valve piston to the interior of the rear end portion of said main ram cylinder when said prefill valve piston is in its said second position,

pressurized fluid source means,

a first multiposition valve external to said main and booster ram cylinders and being connected to said pressurized fluid source means,

conduit means operably connected to said first multiposition valve for directing pressurized fluid to said first chamber in said support means in a first position of said first multiposition valve and for directing pressurized fluid to the interior of said main ram cylinder ahead of said forwardly directed surface of said main ram in a second position of said first multiposition valve, and

means, including a second multiposition valve external to said main and booster ram cylinders and having a position it assumes just prior to actuation of said first multiposition valve to the said second position of said first multiposition valve, for communicating said space behind said prefill valve piston with said source of prefill fluid to relieve the pressure behind said main ram prior to application to said main ram of fluid pressure in a direction to retract said main ram.

3,916,767

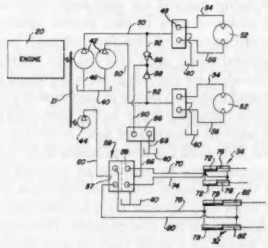
HYDRAULIC CONTROL CIRCUIT FOR VEHICLES

Robert M. Barton, Burlington, Iowa, assignor to J. I. Case Company, Racine, Wis.

Filed June 14, 1973, Ser. No. 369,800

Int. Cl.[2] F15B *13/09*

U.S. Cl. 91—412 **5 Claims**



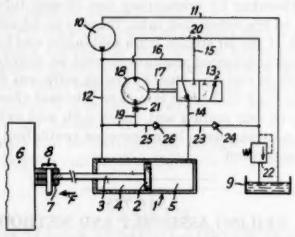
1. In a vehicle having a main hydraulic circuit including first and second hydraulic motor means, main pump means including first and second pumps, first conduit means connecting said first pump to said first motor means for supplying fluid under pressure to said first motor means, second conduit means connecting said second pump to said second motor means for supplying fluid under pressure to said second motor means, first and second control valves respectively located in said first and second conduit means for controlling flow be-

tween said pumps and said motor means, auxiliary pump means connected to auxiliary valve means for supplying fluid to operate a material handling means, selector valve means connected to said auxiliary valve means, first and second conduits respectively connecting said selector valve means to said first and second conduit means between said main pump means and the respective motor means, each of said first and second conduits having a check valve therein preventing flow from said first and second conduit means to said selector valve means to said conduit means so that additional fluid is supplied from said auxiliary pump means directly to said motor means when said selector valve means is in an operative position and the pressure of fluid from said selector valve means is greater than the pressure of the fluid in said first and second conduit means.

3,916,768
HYDRAULIC CYLINDER FOR PROVIDING RECIPROCATION OF A HYDRAULIC JACK

J. Louis E. Martin, Senlis, France, assignor to Poclain, Le Plessie Belleville, France

Filed Feb. 20, 1973, Ser. No. 333,555
Claims priority, application France, Feb. 24, 1972, 72.06315
Int. Cl.² F15B *15/17*
U.S. Cl. 91—417 **1 Claim**

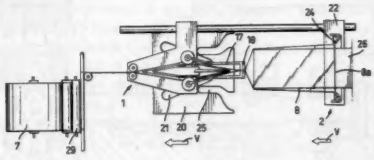


1. A hydraulic fluid circuit system for providing pressurized control fluid to provide cyclic operation of a double-action hydraulic jack, said system including a hydraulic jack cylinder, a piston mounted in said hydraulic cylinder for reciprocation, said piston having a first face defining one side of a first chamber in said hydraulic chamber and a second face on an opposite side, said second face being smaller than said first face and defining one side of a second chamber in said hydraulic cylinder, a piston rod extending from said second face and being at least partly contained within said second chamber, said hydraulic cylinder, piston and piston rod comprising said hydraulic jack, a fluid reservoir, a distributor valve means positionable in first and second positions, a first conduit connecting said distributor valve means to one of said chambers, a second conduit connecting said distributor valve means to said fluid reservoir, a third conduit connecting said distributor valve means to a fluid accumulator which comprises a source of pressurized fluid, a conduit connecting said second chamber to the output of a pump to provide movement of said piston toward said first chamber when said first chamber is below a predetermined pressure level, said distributor valve means including means defining a passageway providing communication between said first conduit and said third conduit while simultaneously blocking said second conduit when said distributor valve means is in its said first position, said distributor valve means further including means directly communicating said first conduit with said second conduit while simultaneously blocking said third conduit when said distributor valve means is in its second position, a fluid-actuated rotary engine having an inlet and an exhaust, coupling means coupling said rotary engine to said distributor valve means for moving said distributor valve means between said first position and said second position, a fourth conduit connecting the inlet of said rotary engine to the fluid accumulator, a flow restriction means mounted in said fourth conduit, a fifth conduit connecting the exhaust of said rotary engine to said fluid reservoir, calibrated pressure responsive valve means mounted in said fifth conduit between said fluid reservoir and said exhaust of the rotary engine, a sixth conduit connecting the first conduit to a portion of the fifth conduit between said rotary engine exhaust and said calibrated valve means and a non-return valve mounted in said sixth conduit for allowing hydraulic fluid to pass from said fifth conduit toward said first conduit.

3,916,769
APPARATUS FOR FORMING A SACK FROM A CONTINUOUS TUBE BLANK

Lasse Juhani Turunen, Mantta, Finland, assignor to G. A. Serlachius Oy, Mantta, Finland

Filed May 3, 1974, Ser. No. 466,888
Claims priority, application Germany, May 7, 1973, 23228402
Int. Cl.² B32B *31/18*; B31B *1/78*; B32B *31/20*
U.S. Cl. 93—24 **6 Claims**

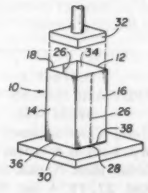


1. An apparatus for forming a sack from a continuous tube blank (8) of flexible material such as plastics and for stretching out said sack to an opened position upon a filling rack (4) comprising at least two jaws (26), said apparatus comprising two aligned carriages (1,2) sequentially movable along the same path, one carriage (2) being provided with means (24) for gripping the edge (8a) of the mouth of said tube blank and for pulling said tube blank upon the jaws of the filling rack (4), the other carriage (1) being provided with means (16) for spreading out the mouth opening of said tube blank and means (18) for closing the end of the bag by transverse seaming and cutting of said tube blank when the first-mentioned carriage (2) has pulled a desired tube blank length upon said rack (4).

3,916,770
METHOD OF MAKING A FLAT BOTTOM BAG

Violet M. Hanson, 14 Fairway Drive, Old Bethpage, N.Y. 11804

Filed July 3, 1973, Ser. No. 376,112
Int. Cl.² B31B *31/60*
U.S. Cl. 93—35 SB **6 Claims**



1. The method of making a double-sealed bag comprising the steps of forming a sleeve having opposed faces and sides, gusseting said opposed sides of the sleeve inward between said opposed faces.

seaming closed the bottom of said sleeve to seal said opposed faces together with the gusseted sides seamed therebetween,

pressing flat against the inside of the closed bottom by applying a force to the whole of the gusseted sides on the inside of the bag to form flaps having folds with said opposed faces such that the gusseted sides and flaps are in overlying relationship,

and joining together to seal preselected portions of said overlying sides and faces to retain said flat bottom.

3,916,771

SEALING ARRANGEMENT

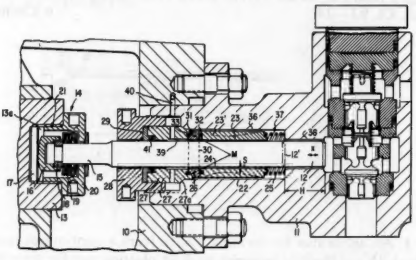
Gerhard Nendzig, and Elmar Muller, both of Urach, Germany, assignors to Pumpenfabrik Urach, Urach, Germany

Filed June 6, 1974, Ser. No. 477,089

Claims priority, application Germany, June 7, 1973, 2328963

Int. Cl.[2] F01B *31/20;* **F16J** *15/18*

U.S. Cl. 92—86 **19 Claims**



1. A sealing arrangement, comprising housing means having a pressure chamber and an outlet; reciprocable means mounted in said housing means; a deformable sealing sleeve in said housing means surrounding said reciprocable means and having inner and outer surfaces one of said surfaces forming with one of said means an annular axial gap communicating at one end thereof with said pressure chamber and at the other end thereof with said outlet so that the pressure in said gap decreases from said one end to said other end, and the other surface forming with the other one of said means a closed control chamber along the length of said sleeve communicating with said pressure chamber so that equal high pressure in said control chamber opposes the pressure acting in said gap on said sleeve whereby said sleeve is deformed and the diameter thereof is reduced in the region of said other end of said gap; and mounting means mounting said sleeve for limited radial and angular self-centering displacement transversely of said reciprocable means, said mounting means including a spherically curved axial face, said mounting means establishing at least an indirect connection between said sealing sleeve and said housing means.

3,916,772

DEVICE AT SUPPLY AIR MEANS WITH THROTTLING MEMBER

Lars-Erik Lindestrom, Kristinehamn, and Birger Larkfeldt, Odens Jo-Barnarp, both of Sweden, assignors to Aktiebolaget Svenska Flaktfabriken, Nacka, Sweden

Filed Apr. 22, 1974, Ser. No. 462,778

Claims priority, application Sweden, May 7, 1973, 06408/73

Int. Cl.[2] F24F *13/08*

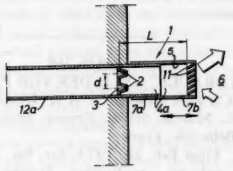
U.S. Cl. 98—38 **3 Claims**

1. Apparatus for supplying a flow of primary air from a high-pressure air source to a room by way of an outlet to the room, comprising:

a plurality of adjacent, generally parallel ejecting nozzles each having a flow aperture for directing primary air supplied thereto generally along the same direction;

means for supplying primary air from said source to each of said nozzles to produce from said flow apertures a flow of primary air which is substantially constant despite changes in air-flow conditions downstream of said apertures;

an enclosed flow chamber for receiving said primary air from said apertures and having an outlet end through which air from said chamber is delivered to said room outlet, and a grating across said outlet end;



said flow chamber comprising two telescopically-arranged tubes, one supporting said grating and one surrounding said apertures, so as to permit adjustment of the length of said chamber by telescoping one of said tubes with respect to the other said tube, thereby to adjust the throw length of the air stream from said outlet end to said room without substantial reaction on said air supply source;

the length of said flow chamber being sufficient that secondary air from said room is sucked into said chamber at the edges of said grating and mixed with said primary air to form a substantially homogeneous ventilation air current into said room.

3,916,773

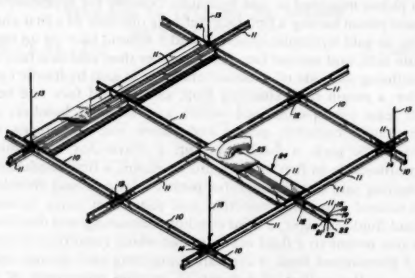
CEILING ASSEMBLY AND METHOD

Paul D. Dail, San Gabriel, Calif., assignor to United States Gypsum Company, Chicago, Ill.

Filed Aug. 17, 1973, Ser. No. 389,411

Int. Cl.[2] F24P *13/06*

U.S. Cl. 98—40 D **2 Claims**



1. In a ceiling assembly over a room, the combination of:

a plurality of main and cross runners which intersect to form a grid for supporting ceiling tile and air diffusers,

at least one air diffuser being disposed over and extending along a portion of the length of one of said runners, said air diffuser being connectable to a source of air under differential pressure relative to that of said room and having a downwardly-directed, air-emitting opening, and at least one removable cap member over at least a portion of the length of said one runner beneath said air-emitting opening of said air diffuser, said cap member being supported at least in part by the top of one said runner, said

cap member being sufficiently continuous to prevent major amounts of air from going through the cap member, and said cap member having a shape and configuration which alters the air diffusion characteristics of said one runner with respect to air emitted from said air diffuser disposed above said runner, wherein said removable cap member has oppositely-extending side flanges along its length which extend beyond the sides of the runner on which said cap member is removably disposed, said side flanges serving to influence the flow of air from said air diffuser,

wherein said air diffuser includes walls defining a box-like chamber open on one side, and spaced-apart downwardly-extending elongate inverted T-bars, the facing flanges of which serve to direct air from said air diffuser,

wherein said air diffuser includes vanes extending parallel to the facing flanges of said downwardly-extending inverted T-bars and to said side flanges of said cap member, said vanes having a width greater than the distance between respective facing flanges of said inverted T-bar and side flanges of said cap member, each of said vanes being pivotable about its elongate axis from a position where one side of the vane contacts the facing flanges of the downwardly-extending inverted T-bar of said diffuser, closing off the passage of air therebetween, to a position where the other side of the vane contacts the corresponding side flange of the cap member, closing off the passage of air therebetween, and each of said vanes being bent upward from its elongate axis,

and wherein the main and cross runners have a slot running the length thereof for attaching the upper edge of a demountable partition assembly thereto, and said combination still being capable of diffusing air when a demountable partition is mounted therein,

whereby the location of said air diffuser in said ceiling assembly can be conveniently changed to alter the emission location and the flow direction of air into said room.

3,916,774

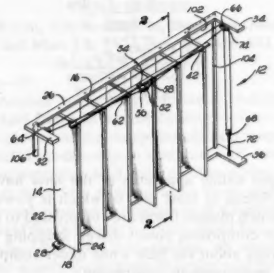
ADJUSTABLE VERTICAL LOUVER SYSTEM

Robert L. LaBrec, 5428 Redlands Drive, San Diego, Calif. 92115

Continuation of Ser. No. 350,842, April 13, 1973, abandoned. This application Nov. 25, 1974, Ser. No. 526,566

Int. Cl.[2] F24F *13/11*

U.S. Cl. 98—107 **4 Claims**



1. An adjustable vertical louver system, comprising:

a plurality of vertically disposed louver slats each slat defined by a top end, a bottom end, a pivotable side, and a free side;

a top support member and a bottom support member;

pivot means adjacent the pivot side of each of said slats for pivotally interconnecting said top support member and the top ends of said slats;

pivot means adjacent the pivot side of each of said slats for pivotally interconnecting said bottom support member and the bottom ends of said slats;

a drawbar spanning across the top ends of said plurality of slats;

pivot means adjacent the free side of each of said slats for pivotally interconnecting said draw bar and the top ends of said slats; and

means for adjusting the openings between said louver slats in a plane parallel to said drawbar in one of a plurality of positions, said means comprising guy wire attached to said drawbar, pulleys for providing a travel path for said guy wire, and a spring loaded pulley forming a continuation of said guy wire path.

3,916,775

APPARATUS FOR WINE CHAMPAGNIZATION IN A CONTINUOUS STREAM

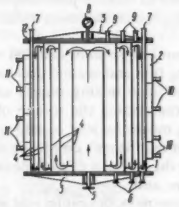
Artemy Arutjunovich Merzhanian, ulitsa Novokuznechnaya, 10, kv. 4, Krasnodar; Sergei Alexeevich Brusilovsky, 5, Nopeichikovskyperevlok, 13, kv. 63, Moscow; Naskid Grigorievich Sarishvili, ulitsa Ceroey Panfilovisev, 1, korpus 4, kv. 52, Moscow; Zbignev Nikolaevich Kishkovsky, ulitsa Begovaya, 22, kropus 3, kv. 207, Moscow; Issal Iosifovich Bronshtein, 1, Dmistrovsky proezd. 4, kv. 1, Moscow, and Mikhail Alexeevich Gagarin, Broisojuznaya ulitsa, 33, kv. 144, Moscow, all of U.S.S.R.

Division of Ser. No. 320,927, Jan. 4, 1973. This application June 20, 1974, Ser. No. 481,474

Claims priority, application U.S.S.R., Jan. 4, 1972, 1737547

Int. Cl. C12g *1/00*

U.S. Cl. 99—277 **1 Claim**



1. An apparatus for continuous-stream wine champagnization, comprising a hermetically sealed cylindrical vessel; a jacket, which forms, in combination with the surface of said vessel, a cavity for refrigerating supply thereinto; a cylindrical partition mounted concentrically with one butt end thereof on a vessel bottom so as to obtain between the other butt end of said partition and the other bottom of said vessel an annular gap for the flow of the material being fermented from the chamber formed by said partition into an annular chamber formed by said partition and the vessel side wall wherein, in order to provide for the stability of the mean linear velocity of the stream of the material being fermented, the free area of the gap in the cylindrical partition and the free area of the annular chamber formed by said partition and the vessel side wall being equal to one another and to the annular gap height multiplied by the length of the cylindrical partition circumference.

3,916,776
JUICER

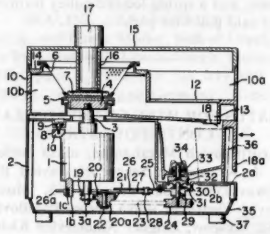
Yuzuru Arao, Takatsuki, and Terukazu Yamauchi, Toyonaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed July 26, 1973, Ser. No. 382,749

Claims priority, application Japan, July 31, 1972, 47-77216; Aug. 1, 1972, 47-77499

Int. Cl.[2] A23N *1/00*; A47J *43/14*

U.S. Cl. 99—503 **13 Claims**



1. A juicer comprising
a. a casing containing a motor,
b. a centrifugal separating basket for separating juice from solid waste, said basket being coupled to said motor to be driven thereby,
c. a juicer container mounted upon said casing for receiving temporarily therein extracted juice and having a juicer discharge port, said basket being positioned within the juice container,
d. juice receiving means releasably mounted on said casing and positioned to receive juice dispensed from said port,
e. juice mixing means disposed within said juice receiving means,
f. rotation transmitting means coupled to said motor, clutch means having first and second disks and being interposed between said juice mixing means and said transmitting means for transmitting the torque of said motor to said juice mixing means by way of said transmitting means,
g. said transmitting means comprising means for selectively transmitting the rotation of said motor to said disc of said clutch means; and
h. means for externally operating said means for selectively transmitting the rotation of said motor to said second disk.

3,916,777
MEAT TENDERIZING SYSTEM

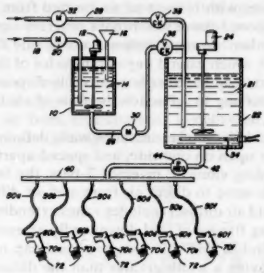
Roscoe T. Earl, Lincolnshire, Ill., assignor to Baxter Laboratories, Inc., Morton Grove, Ill.

Filed Aug. 15, 1973, Ser. No. 388,461

Int. Cl.[2] A23C *4/14*

U.S. Cl. 99—533 **8 Claims**

1. In a system for tenderizing meat in which an injection solution is mixed and fed to a plurality of injection needles through a manifold which distributes the solution to a plurality of flexible hoses, with each of said hoses coupled to a manually operable device including a header having said plurality of injection needles communicating therewith; the improvement comprising manually operable means carried by said device for regulating flow to each header individually, said manually operable means comprising a manually adjustable flow meter coupled to each hose upstream of said header and downstream of said manifold; and means for triggering each of said flow meters to open the flow line thereby permitting a selected, metered amount of injection solution to flow to the respective header for each triggering operation, said flow meter being located adjacent said header to permit the operator triggering said flow meter to adjust said flow meter for each different meat item prior to triggering



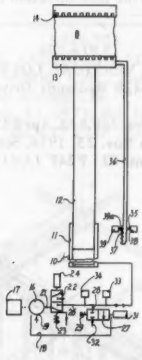
3,916,778
APPARATUS FOR BAILING FIBERS

Donald W. Van Doorn; Jack L. Colquett; James B. Hawkins; William C. Pease, III, and Tommy W. Webb, all of Columbus, Ga., assignors to Lummus Industries, Inc., Columbus, Ga.

Filed Dec. 19, 1973, Ser. No. 426,089

Int. Cl.[2] B65B *13/20*

U.S. Cl. 100—4 **18 Claims**

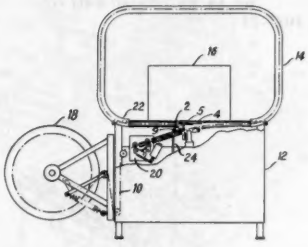


1. In fiber baling apparatus of the kind having relatively movable platens at least one of which is power driven and between which platens fibers are compressed to form the bale, and further comprising power driven strapping apparatus for placing straps about the bale while under compression in the press, the improvements comprising,
a. control means for the power driven platen effective to stop movement of the same toward the other platen when the bale is compacted substantially to a predetermined compressive force and so effective to stop said movement independently of the distance between the platens within a predetermined range of distance therebetween, and
b. control means for the power driven strapping apparatus effective to cause the apparatus to place straps about the bale while being held by the press at the position the power driven platen was stopped.

3,916,779
TAPE-CLAMPING DEVICE

Paul Gutjahr, Zurich, and Hans Luthi, Egg, both of Switzerland, assignors to Erapa AG, Zumikon, Switzerland

Continuation-in-part of Ser. No. 356,517, May 2, 1973, abandoned. This application Nov. 18, 1974, Ser. No. 524,394
Claims priority, application Switzerland, May 26, 1972, 7800/72
Int. Cl.² B65B *13/18*
U.S. Cl. 100—26 **2 Claims**



1. A tape-clamping device comprising:

a clamping member rotatable about a shaft movable toward and away from a fixed clamping jaw, said clamping member having an arcuate tape-engaging end surface remote from and non-concentric with the axis of said shaft;

positioning means for positioning the shaft of the clamping member relative to the clamping jaw from a rest position to an operating position, the rest position being farther from the clamping jaw than the operating position, said clamping member being kept in a clamped position against the tape by self-restraint when a length of tape is passed between the clamping jaw, and the shaft of the clamping member is moved to its operating position;

means for receiving the application of a retaining force to hold said positioning means in said operating position; and

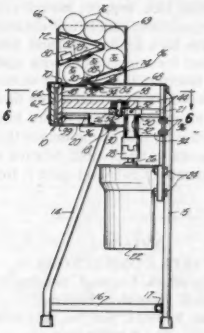
means for rotating said clamping member about said shaft; whereby upon release of said retaining force, the shaft of said clamping member is moved substantially laterally of said tape to said rest position to disengage the clamping member from the tape substantially without friction.

3,916,780
CAN CRUSHER

Warren R. Heiser, 934 N. Mildred, Dearborn, Mich. 48128

Filed Mar. 12, 1974, Ser. No. 450,422
Int. Cl.² B30B *15/30*
U.S. Cl. 100—49 **5 Claims**

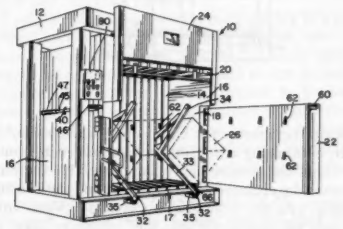
1. A can crusher comprising a frame, a stationary platen mounted in said frame in a substantially vertical position, a reciprocable platen slidably supported in said frame in a substantially parallel relationship to said stationary platen, power means for reciprocating said reciprocable platen through a single cycle from a first position away from said stationary platen to a second position proximate to said stationary platen and back to said first position, a gravity feed chute for feeding cans in sequence between said platens, an aperture at the bottom of said gravity feed chute directing said cans between said platens, means for feeding a single one of said cans at a time through said aperture when said platens are away from each other, said means comprising movable stop means disposed proximate the bottom of said gravity feed chute, means actuated conjointly with said reciprocable platen for controllably disposing said stop means in the path of said can in said chute when said reciprocable platen is in said first position and for retracting said stop means when said reciprocable platen is in said second position, and for preventing said can from dropping between said platens until said reciprocable platen is reciprocated to a position proximate to said first position, said last mentioned means comprising a trap door defining bracket fastened in a substantially horizontal position to said reciprocable platen for closing said aperture when said reciprocable platen is reciprocated proximate to said stationary platen and opening said aperture when said reciprocable platen is reciprocated away from said stationary platen, control means energized by the presence of a can in said chute for actuating said power means, and a plate member disposed for supporting said single can between said platens when away from each other, said plate member having a terminal edge disposed in substantially parallel spaced relationship relative to said stationary platen for defining a gravity eject aperture for a crushed can upon return of said reciprocable platen from said second position to said first position.



3,916,781
BALE EJECTION SYSTEM

Vincent J. Cerniglia, Rosemont, Pa., assignor to American Environmental Products Corporation, Glassboro, N.J.

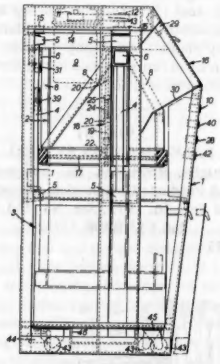
Filed Feb. 16, 1973, Ser. No. 333,271
Int. Cl.² B30B *15/32*
U.S. Cl. 100—53 **13 Claims**



1. A baling apparatus particularly adapted for reducing a volume of solid waste material, such as cardboard and the like, to a substantially smaller volume by packing such material, under pressure, into compacted bales, including frame means defining a compacting chamber therein, a ram mounted for vertical reciprocal movement within said frame means relative to said compacting chamber to exert the pressure on the waste material placed in said compacting chamber required to pack such material into a compacted bale, closure means mounted on said frame means and movable to provide access to said compacting chamber to allow removal of the compacted bale from said chamber subsequent to compaction, and bale ejection means to provide easy, controlled ejection of the compacted bale from said chamber including support means extending through elongated vertical openings in a side of said

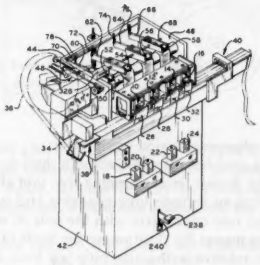
frame, said support means being pivotally mounted on said frame means and movable adjacent the compacted bale to support the bale during the ejection of the bale from said compacting chamber, and bale lift means pivotally mounted on said bale support means external to said compacting chamber, said bale lift means having catch means disposed on an upper portion thereof, said catch means being selectively insertable through said vertical openings, said bale lift means being movable on said bale support means relative to said frame means, when ejection of said bale is desired, from a first non-operating position to a second position where said bale lift means are disposed for engagement with said ram by said catch means being inserted through said vertical openings, said ram moving upwardly within said frame means, said ram engaging said catch means on said lift means to move said lift means upwardly relative to said frame means thereby causing said bale support means to be pivoted relative to said frame means to move the compact bale and eject it from the baling apparatus.

3,916,782
WASTE COMPACTORS
Alan John Booton, Farnham, England, assignor to R. G. Dixon & Company Limited, Wembley, England
Filed Jan. 9, 1974, Ser. No. 431,850
Int. Cl.[2] B30B *15/06*
U.S. Cl. 100—229 A **9 Claims**



1. A waste compactor for compacting waste material in a container, comprising a housing; a waste-receiving container located within the housing and being removable therefrom; a ram mounted for reciprocal movement within the housing and cooperating with the container to compact waste material emptied into the compactor into said container; drive means for reciprocating the ram between a retracted position and a compressed position where it compresses waste material into the container, said ram having an opening therethrough; closure means for closing said ram opening; and control means for opening said closure menas when the ram moves in a direction toward its retracted position and for closing said closure means when the ram moves in a direction toward its compressed position, said control means keeping the ram in its compressed position against previously compressed waste while additional waste material is being emptied into the compactor at a level above said ram and upon selective actuation reciprocating said ram toward its retracted position to open the closure means and permit the collected waste material to pass through said opening into said container and to thereafter reverse the direction of the ram to compress the wasted material that has passed through the ram into said container and to again hold the compressed waste in compression while additional waste is emptied into the compactor.

3,916,783
AUTOMATIC SEQUENTIAL TEXTILE MARKING MACHINE
John F. Filsinger, and Roger P. Mueller, both of Syracuse, N.Y., assignors to Texmark, Inc., Syracuse, N.Y.
Filed Sept. 13, 1972, Ser. No. 272,922
Int. Cl. B41j *29/00;* **B41f** *1/10*
U.S. Cl. 101—21 **14 Claims**



1. Apparatus for automatically imprinting an inscription upon a strip of textile material comprising:
a. a first printing unit having raised type face corresponding to a first portion of the inscription;
b. a second printing unit having raised type face corresponding to a second portion of said inscription;
c. each of said first and second printing units including a type carriage and a ribbon carriage, said type face being mounted on said type carriage and a printing ribbon carrying a transferrable printing medium being mounted on said ribbon carriage between said type face and the textile material;
d. unitary means for supporting and moving said first and second printing units in unison between contacting positions, wherein said first and second portions of said inscriptions are simultaneously printed on said first and second longitudinal increments, respectively, of said strip by contact of said ribbon with said strip and of said type face with said ribbon, and retracted positions wherein said ribbon is spaced from said strip and said type face is spaced from said ribbon;
e. each type carriage and ribbon carriage of each of said printing units each being mounted for independent movement between said contacting and retracted positions;
f. means supporting the textile material with a first longitudinal increment thereof in registration with said first printing unit and a second longitudinal increment thereof in registration with said second printing unit; and
e. drive means for sequentially moving said printing units between said contacting and said retracted position, and for sequentially advancing said strip longitudinally by a distance equal to the spacing between said increments when said printing units are moved to said retracted position.

3,916,784
MACHINE FOR PRINTING ON ARTICLES HAVING TWO INKING STATIONS AND A SINGLE PRINTING STATION COMMON THERETO

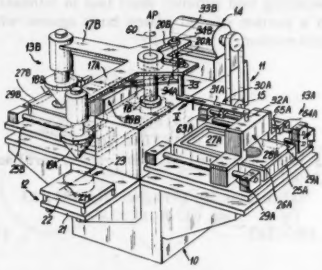
Louis Gilbert Dubuit, 60 rue Vitruve, 75020 Paris, France

Filed Oct. 23, 1973, Ser. No. 408,997

Claims priority, application France, Nov. 10, 1972, 72.39892

Int. Cl.[2] B41F 17/00

U.S. Cl. 101—41 11 Claims



1. A machine for printing on articles, comprising a first inking station, a second inking station, each inking station having a printing block and a carriage with inking means and wiping means mounted for sweeping movement over its associated printing block, a single printing station common to both said inking stations and having a support for articles to be printed, and a transfer unit including a pair of arms each carrying a transfer pad, means mounting the transfer unit for rotational movement between a first travel position in which one of the transfer pads is above one of the inking stations and the other transfer pad is above the printing station and a second travel position in which the other transfer pad is above the second inking station and the one transfer pad is above the printing station, means connecting the transfer unit with each of the carriages for movement therewith, the inking means at one of the stations and the wiping means at the other of the stations being operative during the displacement from the first travel position to the second travel position, and the wiping means at the one of the stations and the inking means at the other of the stations being operative during the displacement from the second travel position to the first travel position, and means mounting the transfer unit for axial reciprocating displacement from each of said first and second travel positions of the transfer pads to corresponding operative positions at the respective stations, and vice versa.

3,916,785
IMPRINTING MEANS FOR A COMPUTER ACCESS TERMINAL

William R. Burger, Plymouth, Mich.; Guy A. Vince, Dayton, and Joseph L. Mitchner, Wilmington, both of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed June 3, 1974, Ser. No. 476,002

Int. Cl.[2] B41J 1/60

U.S. Cl. 101—45 1 Claim

1. In a computer access terminal comprising a keyboard means for entering data into said terminal and having a slot therein for receiving a credit card, and an imprinting means for printing data on a record medium inserted into said terminal in response to data entered on said keyboard means and an imprint signal from said terminal; said imprinting means comprising:

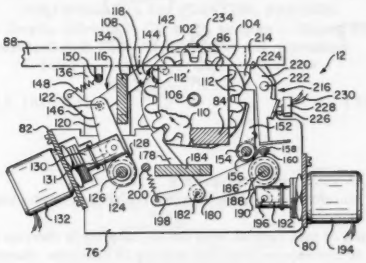
a frame means for securing said imprinting means to said terminal;

a plurality of amount wheel means rotatably mounted in said frame means for representing a multi-digit number; indexing means for each amount wheel means for incrementally indexing the associated said amount wheel means one digit position relative to a print line each time the indexing means is actuated so that each amount wheel means is successively indexed a predetermined number of times to effect a predetermined number of digit positions of indexing corresponding to an associated digit entered on said keyboard means;

and actuating means for each said indexing means to actuate each said indexing means the associated said predetermined number of times corresponding to the associated digit entered on said keyboard means upon the occurrence of said imprint signal;

said indexing means for each said amount wheel means comprising:

a plurality of teeth on the associated said amount wheel means, with one tooth being provided for each digit position;



a pawl means; and

a spring means to bias the pawl means to a first position;

said pawl means being movable from said first position to a second position upon a momentary energization of the associated said actuating means;

said pawl means in moving from said first position to said second position upon the momentary energization of the associated said actuating means being effective to slide over one said tooth of the associated said amount wheel means against the bias of the associated said spring means to thereby engage a next succeeding said tooth, and with said spring means being effective to move said pawl means to said first position from said second position to thereby advance the associated said amount wheel means one digit position upon the deenergization of the associated said actuating means;

each said amount wheel means having a lug in a predetermined location on the periphery thereof, and a switch means cooperating with said lug to open said switch means when said lug contacts said switch means as said amount wheel means is being rotated by its associated indexing means to thereby deactivate the associated said actuating means to thereby align said amount wheel means in a home position with reference to said print line prior to indexing each said amount wheel means said predetermined number of times;

said imprinting means further including a support shaft mounted in said frame means, and in which each said actuating means comprises:

an actuating arm means having a first end pivotally mounted on said support shaft for movement between a first position and second position and also having a second end;

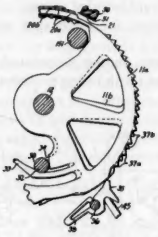
means for pivotally mounting the associated pawl means between its ends on said second end; and

an actuator for pivotally moving the associated actuating arm means from said first position to said second position; each said amount wheel means having a plurality of characters around a portion of the periphery thereof and also having a flat portion on said periphery; each said amount wheel means having its associated flat portion aligned with said print line when in said home position to enable a credit card to be moved in said slot over said plurality of amount wheel means when each said amount wheel means is in said home position.

3,916,786
DRUM SERIES PRINTER WITH TYPE MEMBERS ARRESTED BY STAGGERED STOP PAWLS

John G. Clary, Pasadena, Calif., assignor to Addmaster Corporation, San Gabriel, Calif.

Filed Mar. 13, 1974, Ser. No. 450,846
Int. Cl.[2] B41J *1/08*
U.S. Cl. 101—93.37 7 Claims

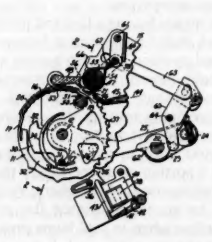


1. A data printer comprising
a plurality of type devices having spaced type characters thereon,
each of said type devices having stop teeth thereon spaced to correspond with the spacing of said type characters;
yieldable drive means for advancing said devices from initial positions past a printing station,
stop pawl devices engageable with said teeth of respective ones of said type devices,
means for actuating said stop pawls at different times to engage different ones of said teeth whereby to present different ones of said type characters to said printing station, and
printing impression means for transferring an imprint on said type characters at said printing station to a record medium,
the type characters and stop teeth of a first series of said type devices being spaced at a single distance from said printing station and from their respective stop pawls, and the type characters and stop teeth of a second series of said type devices being spaced at a single different distance from said printing station and from their respective stop pawls when all said type devices are in said initial positions.

3,916,787
PRINTING PLATEN

Richard L. Roggensack, El Monte, Calif., assignor to Addmaster Corporation, San Gabriel, Calif.

Filed Apr. 18, 1974, Ser. No. 461,997
Int. Cl.[2] B41J *11/18*
U.S. Cl. 101—93.41 3 Claims

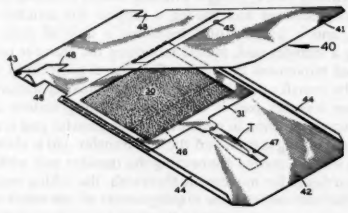


1. In a data printer,
means carrying printing type characters,
a printing platen extending over said type characters and normally spaced therefrom,
means for causing said platen and said type characters to impress a record medium therebetween,
said platen comprising a body of relatively soft elastomeric material,
a stiffener sheet of relatively hard flexible material extending over said body, and
means including a spring acting on said stiffener sheet for maintaining said stiffener sheet taut in intimate contact with a portion of said platen body against which said record medium is impressed.

3,916,788
CHECK PRINTING DEVICE

Manuel J. Rodriguez, 4561 NE. 5th Terrace, Fort Lauderdale, Fla. 33308

Filed June 20, 1974, Ser. No. 481,123
Int. Cl.[2] B41J *35/02*
U.S. Cl. 101—102 17 Claims



1. In a printer for bank checks and the like having a platen and selectively adjustable printing members mounted opposite said platen for movement toward and away from the platen to make impressions on a check on the platen, the improvement which comprises:
an inked tape positioned in confronting relationship to said printing members and extending across said platen, said inked tape being substantially longer in one direction than the platen;
and means supporting said inked tape for selective adjustment in said one direction across the platen to present a different selected portion of the inked tape at the platen to ink the impressions made on the check by said printing members,
said means supporting the inked tape for selective adjustment comprising:
a frame holding said tape, said frame having a tab extending therefrom in said one direction;
and a holder receiving said frame and tape and having an opening therein for exposing the tape to the check on the platen, said holder having a slot therein elongated in said one direction and receiving said tab on the frame to lock the frame at different selected positions in said one direction for positioning different segments of the tape at the platen.

3,916,789
PRINTING

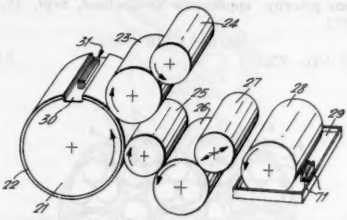
Peter Edward Watts, Reading, and Ernest Michael Holden, Slough, both of England, assignors to Vickers Limited, London, England

Filed Sept. 11, 1973, Ser. No. 396,244

Claims priority, application United Kingdom, June 22, 1973, 29917/73; Sept. 12, 1972, 42390/72

Int. Cl.[2] B41F *25/00, 31/00*

U.S. Cl. 101—148 **2 Claims**



1. A lithographic printing machine comprising

i. a printing roller,

ii. a lithographic printing plate having opposite ends and mounted on the printing roller to form a gap between the opposite ends, the printing plate having a surface including water-receptive areas and ink-receptive areas,

iii. a means of applying water to the water-receptive areas of the surface of the printing plate,

iv. a pad located on the printing roller in the gap to receive water from the water applying means, the pad including a surface in which is mounted a pair of electrodes spaced by electrically insulating material,

v. terminals on the printing roller for electrical contact with the electrodes,

vi. a means connected to the terminals, for measuring electrical resistance and,

vii. a means of applying ink to the ink-receptive areas of the surface of the printing plate.

3,916,790
CONTROL DEVICE FOR BLOWING AND SUCTION AIR IN PRINTING PRESSES

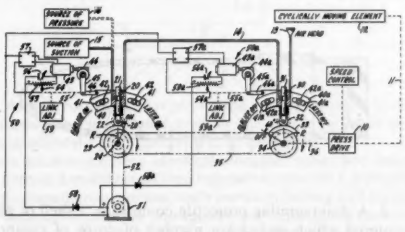
Hans Alix, Offenbach am Main, Germany, assignor to Roland Offsetmaschinenfabrik Faber & Schleicher AG, Germany

Filed Oct. 21, 1974, Ser. No. 516,668

Claims priority, application Germany, Oct. 22, 1973, 2352864

Int. Cl.[2] B41F *13/24*

U.S. Cl. 101—232 **7 Claims**



7. In a device for controlling the application of air at an air head in a sheet-fed printing press, the combination comprising a press drive, a cyclically moving element in the press coupled to the press drive, an air supply including an air line, an air head connected to the air line and cooperating with the cyclically moving element in phased relation, an "on" air valve and a "off" air valve connected in series with the line, overlapping cams coupled to the press drive for sequentially operating the air valves to produce an "on" condition in which the two valves are both open to flow of air, "on" and "off" control elements associated with the respective valves and separately shiftable for separate control of the "on" and "off" points of phase, and separate means for adjusting the control elements in accordance with changes in press speed for shifting in phase the interval during which air is applied to the head as well as varying the angular duration of the interval.

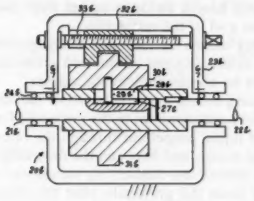
3,916,791
ADJUSTING DEVICE FOR THE LATERAL INK DISTRIBUTION ON PRINTING PRESSES

Claus Simeth, Offenbach, Germany, assignor to Roland Offsetmaschinenfabrik Faber & Schleicher AG, Germany

Filed June 14, 1973, Ser. No. 370,054

Int. Cl.[2] B41L *27/08*

U.S. Cl. 101—141 **1 Claim**



1. In a lithographic printing press the combination comprising a plate cylinder having an associated blanket cylinder, a drive train therefor, a form roller on the plate cylinder, an ink fountain, a set of rollers defining an ink path from the fountain to the form roller, at least one roller in the set being mounted for endwise vibration, a reciprocating mechanism coupled to the vibrated roller for converting the rotary motion of the drive train to endwise movement of the vibrated roller, the reciprocating mechanism being coupled to the drive train for reciprocating the vibrated roller with a particular amplitude of throw and in a particular phase relation with the drive train and hence with the plate cylinder, a phase changer interposed between the drive train and reciprocating mechanism, the phase changer having an input shaft and an output shaft driven by said drive train arranged coaxially end to end with respect to the input shaft, said output shaft driving said reciprocating mechanism, said phase changer including, coupling means for coupling together said ends, the coupling means including means for angularly offsetting the shafts with respect to one another with an infinitely variable angle, and adjusting means for the offsetting means to vary the degree of offset, said adjusting means having a rotary portion which rotates with the input and output shafts and a setting portion which is stationary with respect to the printing press, said setting portion having means to move said rotary portion relative to said ends while said printing press is in operation so that the relative phase of the input and output shafts may be varied while the shafts rotate thereby to enable immediate observation in the printed result of a change in the phase of the vibration of the vibrated roller with respect to the rotary phase of the plate cylinder, the phase changer being independent from the reciprocating mechanism to the extent that movement of the setting portion of the adjusting means produces a change in the phase of said at least one roller relative to the plate cylinder, without producing any change in the amplitude of throw imparted to said at least one roller by the reciprocating mechanism.

3,916,792
LIQUID PROPELLANT WEAPON

Lester C. Elmore, Portola Valley, and Thomas M. Broxholm, Palo Alto, both of Calif., assignors to Pulsepower Systems, Incorporated, San Carlos, Calif.

Division of Ser. No. 179,759, Sept. 13, 1971, Pat. No. 3,803,975. This application Oct. 23, 1973, Ser. No. 408,571

Int. Cl. F42b *5/02*

U.S. Cl. 102—38 **8 Claims**

1. A projectile-carrier assembly for a liquid propellant gun comprising,

a projectile having a sidewall,

propellant flow passage means in a sidewall of the projectile at the rear end of the projectile,

a carrier having a sidewall,

said carrier having an open ended front part for receiving the rear end of the projectile,

connecting means on the carrier engageable with the projectile to connect the carrier and projectile so the projectile can be transported by the carrier,

and opening means in the sidewall of the carrier associated with the passage means in the projectile for permitting the flow of liquid propellant through the opening means and passage means and between the projectile and the carrier to disconnect the connecting means and to separate the carrier from the projectile after the projectile has been placed in firing position in the gun.

3,916,793
SELF-PROPELLING PROJECTILE FOR FIREARMS

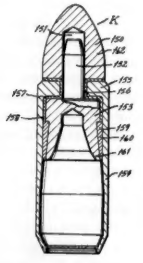
Giovanni Galluzzi, Lecco (Como), Italy, assignor to Giulio Fiocchi, S.p.A., Lecco, Italy

Division of Ser. No. 209,032, Dec. 17, 1971, Pat. No. 3,808,973. This application Mar. 12, 1974, Ser. No. 450,305

Claims priority, application Italy, May 31, 1971, 25246/71; Nov. 30, 1971, 31868/71

Int. Cl.² F42B *5/26*

U.S. Cl. 102—38 **6 Claims**



1. A self-propelling projectile comprising an electrically conductive nose, means defining a casing for receiving a propellant charge, an electrically conductive connector having a rearward cylindrical portion and a forward plug, said plug being engaged to said nose, said connector cylindrical portion being disposed within said casing and being relatively reduced diametrally in its rearward end portion for creating a chamber between same and the confronting portion of said casing, a priming composition disposed in said chamber and in direct contact with the cylindrical portion of said connector and with the propellant charge, and dielectric means between said nose and said casing and between said connector forwardly of said chamber and said casing.

3,916,794
PROJECTILE WITH SECONDARY PROJECTILES AND FIRING APPARATUS FOR SUCH PROJECTILE

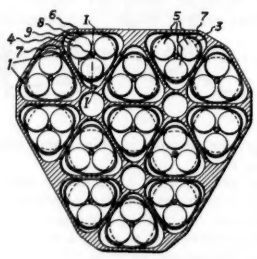
Cornelius Mayer, Fallanden, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zurich, Switzerland

Filed Sept. 17, 1973, Ser. No. 397,809

Claims priority, application Switzerland, Sept. 26, 1972, 14112/72

Int. Cl.² F42B *13/50*

U.S. Cl. 102—92.3 **3 Claims**



1. In a rocket comprising a rocket jacket and a substantially circular-cylindrical housing secured at the rearward end of the rocket jacket and containing a propellant charge, said rocket jacket containing a plurality of adjacently situated substantially circular-cylindrical projectiles, the improvement comprising said rocket jacket having a substantially polygonal cross-section having a plurality of corners and containing in each corner thereof at least one of said secondary projectiles, said propellant charge housing having the same diameter as a circle inscribed within the outer contour of said polygonal cross-section of the rocket jacket.

3,916,795
DISINTEGRATING PROJECTILE

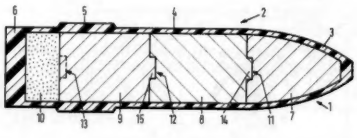
Herman Lemstra, Veghel, Netherlands, assignor to Nederlandsche Wapen- en Munitiefabriek "De Kruithoorn" B.V., 's-Hertogenbosch, Netherlands

Filed Feb. 20, 1974, Ser. No. 444,118

Claims priority, application Netherlands, Sept. 18, 1973, 7312840

Int. Cl.² F42B *13/20*

U.S. Cl. 102—92.7 **4 Claims**

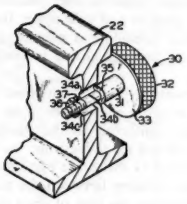


1. A disintegrating projectile comprising a shell of plastics material which includes a number of cores of compressed metal powder arranged axially one behind the other and enclosed within said shell, said cores being provided with cavities, and plug means also of compressed metal powder arranged in said cavities and locating and fixing said cores relatively to one another in the radial direction of said projectile.

3,916,796
VIBRATIONAL DAMPENING ARRANGEMENT FOR RAILROAD CAR RETARDERS

Philip J. DeIvernois, Jr., Monroeville, and Peter M. Noble, Valencia, both of Pa., assignors to Westinghouse Air Brake Company, Swissvale, Pa.

Filed Nov. 15, 1974, Ser. No. 523,980
Int. Cl.² B61B 1/00
U.S. Cl. 104—26 A **11 Claims**

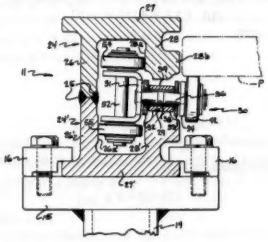


1. In combination, a railroad car retarder having a plurality of operating units disposed along the length of a running rail of a trackway, an elongated braking bar disposed on each side of said running rail and carried by said plurality of said operating units, said elongated braking bar including a brake beam and a brake shoe for engaging the wheels of railway vehicles, characterized by a plurality of vibration absorbing rotary devices disposed at selected points along the running rail for contacting the vehicle wheels for removing vibrational energy from the wheels for preventing the production of wheel screeching sounds.

3,916,797
POWER DRIVEN CONVEYOR

Bruce E. Block, and Philip H. Samuelson, both of Rockford, Ill., assignors to Rockford Automation, Inc., Rockford, Ill.

Filed Mar. 11, 1974, Ser. No. 449,647
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² B61B 13/08
U.S. Cl. 104—172 B **10 Claims**



1. A power driven conveyor having spaced, parallel trackways extending in a closed loop so that the conveyor is and endless conveyor, and comprising, in combination:

each trackway having identical elongate, upper and lower extruded members welded together to provide a generally C-shaped cross-section, each trackway having wall means defining an internal passageway and arranged to provide a laterally opening access to the passageway, said access opening facing the other trackway and extending the full length of the trackway;

the upper member having a generally upright face on the wall means directly above the access opening and defining part of the internal passageway;

the lower member having a generally upright face on the wall means opposite the access opening and at a level there-below, and defining part of the internal passageway; the lower member also having an upwardly facing bearing surface at the bottom of the access opening;

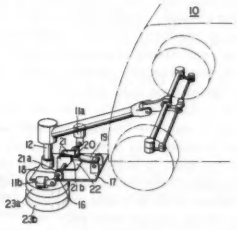
a conveyor chain disposed in each access opening and in contact with the bearing surface; each chain having a plurality of wheels mounted thereon and disposed in the internal passageway; about one-half of said wheels arranged to contact and ride against the upright face directly above the access opening, and the remainder arranged to contact and ride against the upright face opposite the access opening; and

means engaged with the conveyor chains for driving them along their respective trackway.

3,916,798
GUIDING SYSTEM FOR A COMPUTER CONTROLLED VEHICLE

Takemochi Ishii; Masakazu Iguchi, and Masaki Koshi, all of Tokyo, Japan, assignors to Japan Society for the Promotion of Machine Industry, Tokyo, Japan

Continuation-in-part of Ser. No. 280,838, Aug. 15, 1972, Pat. No. 3,844,224. This application July 17, 1974, Ser. No. 489,452
Claims priority, application Japan, Aug. 19, 1971, 46-62587; Aug. 19, 1971, 46-62588; Aug. 19, 1971, 46-62589
Int. Cl.² B61F 9/00
U.S. Cl. 104—247 **4 Claims**



1. A guide system for a vehicle supported on wheels and travelling along a predetermined route in a traffic network of main and branch tracks under control of a computer, said system comprising:

guide channels generally of a rectangular cross-section and extending along the center lines of said tracks below the upper surfaces thereof;

reference guide rails fixedly located on opposite sides of center lines of said guide channels and having opposing guide surfaces in face-to-face relation with vertical side walls of said guide channels;

a steering guide link connected to the steering mechanism of said vehicle and extending into said guide channels;

a pair of horizontally revolving guide wheels mounted on said steering guide link for engagement with opposing vertical guide surfaces on said side walls of said guide channels;

guide follower means including a rotary shaft mounted on said steering guide link and rotatable through a predetermined angle, and a pair of follower rollers mounted at opposite ends of said rotary shaft in angularly offset positions and adapted to engage selectively said guide surfaces of said reference guide rails in a manner to effect controlled steering of said vehicle; and

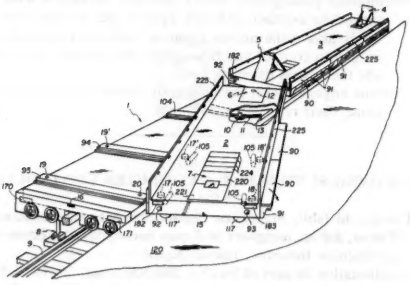
means for rotating said rotary shaft through said predetermined angle for moving said follower rollers into and out of engagement with said guide surfaces of said reference guide rails in response to a control signal.

3,916,799

RAIL CAR WITH SWING PLATFORM AND VERTICAL POSITION FIXING MEANS

Allen E. Smith, Dennison Road, Essex, Conn. 06426

Filed Dec. 5, 1974, Ser. No. 529,969
Int. Cl.[2] B65J 1/22
U.S. Cl. 105—368 B 22 Claims



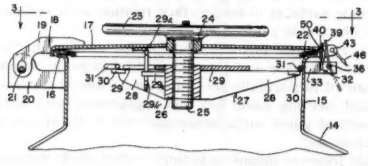
1. A rail car having a deck and at least one swing platform pivotally mounted thereon for movement relative to said deck of the rail car in a substantially horizontal plane, comprising:
means for selectively swinging said at least one swing platform toward a fixed loading platform, or the like;
means on said rail car for fixing the position of said rail car relative to the rails and to the loading platform and for preventing changes in elevation in the rail car relative to the loading platform during unloading and/or loading operations, said fixing means including:
extendable strut means extending downward from at least three positions on said rail car;
means on said extendable strut means for selectively engaging a rail and for locking onto said rail;
means for locking said extendable strut means in an extended position in engagement with said rail; and
means for selectively raising and lowering said extendable strut means so as to cause said extendable strut means to selectively engage said rail.

3,916,800

LATCHING ARRANGEMENT FOR HATCH COVER

John W. Hutchison, Crown Point, and Harold E. Hesch, St. John, both of Ind., assignors to Pullman Incorporated, Chicago, Ill.

Filed June 5, 1974, Ser. No. 476,492
Int. Cl.[2] B61D 39/00
U.S. Cl. 105—377 2 Claims



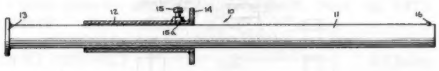
1. In a vehicle hopper arrangement having
a lower discharge portion,
a horizontal covering wall at the upper portion of said hopper including a vertical tubular wall having an upper flange defining an inlet opening into said hopper,
a cover supported on said covering wall movable upwardly from a closed position to an open position,
said cover having a peripheral portion and a flange extending downwardly from the peripheral portion and being adapted in the closed position to overlap said upper flange,
means for moving said cover between said positions including manually operable means for tightly urging said peripheral portion toward said upper flange; the improvement comprising,
a seal arrangement for sealing said inlet opening in the closed position of said cover including;
a resilient seal supported on the underneath side of the peripheral portion of said cover and in the closed position being disposed adjacent and coextensive with both said peripheral portion and said upper flange,
a latch bracket including a pair of spaced parallel arms connected to and projecting laterally from said tubular wall,
a latch element pivotally connected between said arms adjacent the distal ends of the arms,
a guide plate connected to the flange of the cover and extending downward therefrom,
the lower portion of the guide plate having a width slightly less than the spacing between the pair of arms for being received between the pair of arms toward the connected ends of the pair of arms from the latch element,
a tongue attached to the guide plate and projecting laterally from the cover,
said tongue having its plane in a vertical plane,
said latch element having a slot for receiving said tongue only when said cover is in a closed position with a predetermined degree of compression of said resilient seal,
said tubular wall including stop means therein,
said means for moving said cover including a hand wheel rotatably connected to said cover and including rotatable drive means,
driver means connected to said drive means, and
said driver means including vertically movable spider means engageable with said stop means for compressing said resilient seal.

3,916,801

COMBINATION LIFTING AND BRACING RODS FOR ROLLS

William F. Henderson, Winnsboro, S.C., assignor to Uniroyal, Inc., New York, N.Y.

Filed May 13, 1974, Ser. No. 469,106
Int. Cl.[2] B61D 45/00
U.S. Cl. 105—486 10 Claims

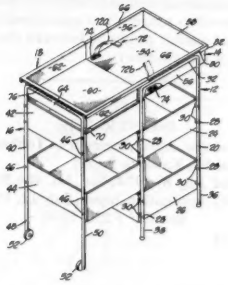


1. A combination lifting and bracing rod structure for a roll of sheet or strand material wound on a tubular core, comprising an elongated rod adapted to be inserted longitudinally into the roll core, a sleeve slidably mounted on said rod, said rod having transversely protruding means at one end to define an abutment or stop for said sleeve, said traversely protruding means being of sufficient height to prevent installation of said sleeve on said rod at said one end in the presence of said abutment, said sleeve having transversely outwardly protruding means at that one of its ends facing the other end of said rod to define an abutment or stop engageable with the proximate end of a roll core, and means for locking said sleeve and said rod to one another in any selected adjusted relative position thereof.

3,916,802
INFANTS DRESSING TABLE

Richard J. Virtue, Palos Verdes Estates, and Jose M. Barba, Granada Hills, both of Calif., assignors to Pride-Trimble Corporation, Burbank, Calif.

Filed Aug. 5, 1974, Ser. No. 494,731
Int. Cl.² A47B *17/00, 83/00*
U.S. Cl. 108—27 **6 Claims**



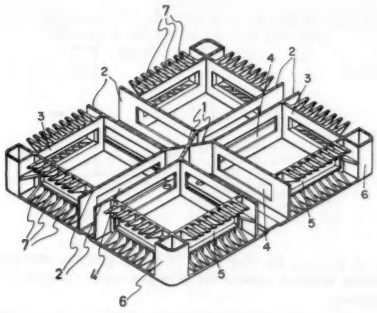
1. An infants dressing table comprising:
a. a first base section;
b. a first top section carried by said first base section, said first top section comprising;
1. a floor;
2. upstanding side walls; and
3. an end wall interconnecting said side walls;
c. a second base section movable relative to said first base section from an extended position into a nested position;
d. a second top section slidably movable relative to said first top section from an extended position to a closed position, said second top section being supported by said second base section when the latter is in an extended position, and comprising:
1. a floor;
2. upstanding side walls; and
3. an end wall interconnecting said side walls; and
e. locking means carried by said second base section in operative engagement with said second top section so as to block extension thereof when said first and second base sections are in a nested position whereby sliding movement of said second top section relative to said first top section is prevented when said first and second base sections are in a nested relationship.

3,916,803
LOADING PLATFORM

Emilia Miguel Garcia, P° Bonanova, 77 Barcelona, Spain

Filed Jan. 16, 1974, Ser. No. 433,893
Claims priority, application Spain, Oct. 2, 1973, 195791
Int. Cl.² B65D *19/24*
U.S. Cl. 108—51 **7 Claims**

1. In a loading platform of the pallet type including an upper substantially flat rectangularly-shaped plate, a lower substantially flat rectangularly-shaped plate, and partition members joining said upper and lower plates and extending perpendicular thereto, said partition members forming four lateral sides of said pallet and forming reinforcing means for supporting the weight of a load placed on said upper plate; the improvement wherein:
said partition members comprise:
an X-shaped core element positioned in the geometric center of said pallet and having four legs;
eight internal partition elements, two of which extend outwardly and in directions perpendicular to each other from the outer end of each of said four legs of said core element, said internal partitions being arranged in the form of a cross having four arms, each of said arms being formed by a pair of said internal partitions extending parallel to each other outwardly from said core element to substantially the mid-point of one of the lateral sides of said pallet; and
eight external partition elements, each of said lateral sides of said pallet being formed by two of said external partition elements, each of the two exernal partition elements forming each lateral side joining one of the two internal partition elements forming the respective arm of said cross extending to said each lateral side;

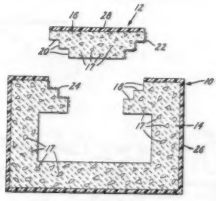


each of said internal and external partition elements having therein openings which align and coincide in directions of said pallet parallel to said lateral sides, the thus aligning and coinciding openings forming tunnel means for receiving the arms of the fork of a fork lift truck; and
all of said partition members and said upper and lower plates being formed in an integral single piece.

3,916,804
FIRE RESISTANT STRUCTURE

Michael J. Noone, Wayne, Pa., assignor to General Electric Company, Fairfield, Conn.

Division of Ser. No. 350,538, April 12, 1973. This application July 15, 1974, Ser. No. 488,302
Int. Cl.² E05G *1/024*
U.S. Cl. 109—78 **2 Claims**

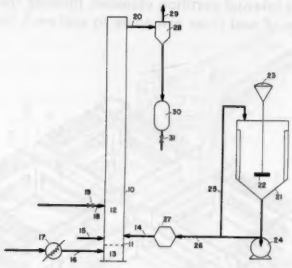


1. A container protective against temperatures up to 1400° C. whose walls comprise a composition of matter comprising:
a. gypsum;
b. discrete particulate inclusions therein of magnesium sulphate heptahydrate $MgSO_4\ 7H_2O$;
c. said container having an aperture provided with steps around its boundary;
d. and a closure plug comprising the same composition of matter as the walls of said container to substantially fill the aperture and having mating steps congruent with the steps of the aperture.

3,916,805
INCINERATION OF NITROGENOUS MATERIALS

Charles D. Kalfadelis, and Alvin Skopp, both of Jerusalem, Israel, assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Dec. 28, 1973, Ser. No. 429,183
Int. Cl.[2] F23G 7/00
U.S. Cl. 110—7 R 18 Claims



1. A process for disposing of a non-gaseous nitrogeneous material without substantial nitrogen oxide formation which comprises:

a. introducing said nitrogeneous material into a fluidized bed reduction zone containing a catalyst for the reduction of NO_x;

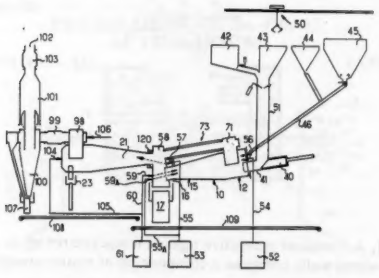
b. contacting said nitrogeneous material in said reduction zone with less than a stoichiometric quantity of oxygen, in the presence of said catalyst; and

c. withdrawing gaseous products of partial oxidation and decomposition from said reduction zone; said catalyst being selected from the group consisting of nickel, cobalt, iron, copper and the nitrates of said metals.

3,916,806
INSTALLATION AND METHOD FOR HEAT TREATMENT OF REFUSE AND/OR SIMILAR PRODUCTS

Yves Giraud, Paris, France, assignor to Laurent Bouillet, S.A., Paris la Defense Cedex, France

Filed June 20, 1974, Ser. No. 481,473
Claims priority, application France, June 20, 1973, 73.22509; May 29, 1974, 74.18648
Int. Cl.[2] F23G 5/06
U.S. Cl. 110—14 25 Claims



1. Installation for the heat treatment of refuse of any type and similar products such as low or poor quality fuels, comprising a one piece combustion chamber formed of three coaxial parts:

a. a substantially cylindrical part having a transverse end wall with an opening for input of the refuse and similar materials;

b. a truncated conical part; and

c. a cylindrical part connecting to the previous part, there being an opening in the vault of the chamber for combustion gas to flow through, said opening being provided at the downstream end of the refuse input part, — relative to the direction of flow of the latter —,

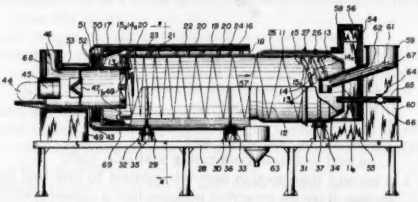
a gas collection hood sealingly mounted onto the external wall of the chamber and covering said vault opening, and

means for imparting to said chamber an oscillating movement around its longitudinal axis in order to propel the refuse and similar products between the entrance and the exit of the chamber.

3,916,807
INCINERATOR

Hiroshi Eiki, Kasugai, Japan, assignor to Tohkai Denkia Tosoh Kabushiki Kaisha, Kasugai, Japan

Filed July 8, 1974, Ser. No. 486,598
Claims priority, application Japan, July 12, 1973, 48-78704
Int. Cl.[2] F23G 5/06
U.S. Cl. 110—14 1 Claim



1. In an incinerator comprising a cylindrical body having an outlet at one end, burner means provided at said outlet, an exhaust gas opening formed at the other end of said body for allowing a gas produced by said burner means to be exhausted through the interior of said body to the exterior thereof, means for rotatably supporting said body in a horizontal posture, means for rotating said body thus supported, blower means for sucking from said gas opening the gas from the interior of said body, and transfer means provided within said body to transfer toward said outlet waste material to be incinerated which is introduced from said other end, said incinerator including a cylindrical outer member disposed to encircle at a predetermined space an outer circumferential portion of said body which includes said outlet and at least an intermediary portion extending therefrom, and a helical screw provided in an inner wall of said outer member thereby to cause incinerated residues produced at said outlet to be transferred through said space toward an incinerated residue receiver.

3,916,808
APPARATUS FOR PRODUCING PANTY HOSE

Giuseppe Cassinelli, Varese, Italy, assignor to Calze Malerba S.p.A., Varese, Italy

Filed July 18, 1974, Ser. No. 489,662
Claims priority, application Italy, July 20, 1973, 26830/73
Int. Cl.[2] D05B 23/00, 1/10
U.S. Cl. 112—63 5 Claims

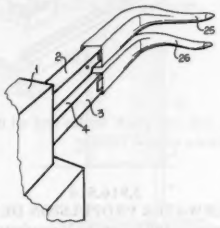
1. In a machine for sewing together two fabric tubes for producing panty hose of the type commonly known as tights, and consisting of two tubular stockings connected together in the region of the open ends thereof, said machine comprising:

a fixed support structure;

first and second substantially horizontal parallel arms one above the other extending from said fixed support structure; means on said first and second arms for sewing two seams in fabrics placed between said arms, and

means for slitting the fabric longitudinally of and between said two seams, being positioned ahead of said sewing

needles with respect to the direction of movement of the fabric the improvement comprising said means for sewing two seams including two pairs of needles mounted on said first arm for reciprocating movement towards and away from said second arm, one pair of needles being offset from the other in the direction of said seams with a first needle of each of said two pairs of needles being positioned in approximate alignment, in the direction of said seams, with said means for slitting the fabric between said two seams so that said first needle of each pair will enter the slit in the fabric,



two pairs of hooks, a first pair being carried on said first arm and a second pair being carried on said second arm,

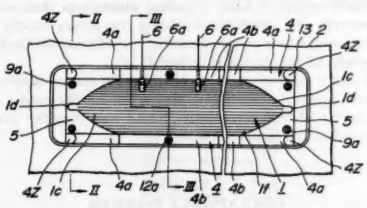
means for feeding threads to said two pairs of needles and said two pairs of hooks and means for imparting synchronised sewing movements to said needles and said hooks whereby to form in a single operation two double rows of stitches and to slit the fabric tubes between the two double rows of stitches to form a pair of tights from said two fabric tubes.

3,916,809

PROTECTIVE DEVICE FOR GAS BAG OF SHIP SAFETY DEVICE

Hiroshi Miyamoto; Miyoshi Kogima, both of Yokohama, and Sadao Hashimoto, Hakodate, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo and Hakodate Seimo Sengu Kabushiki Kaisha, Hokkaido, both of, Japan

Filed Dec. 19, 1973, Ser. No. 426,027
Claims priority, application Japan, Dec. 26, 1972, 48-3188
Int. Cl.[2] B63B *43/14*
U.S. Cl. 114—68 **6 Claims**



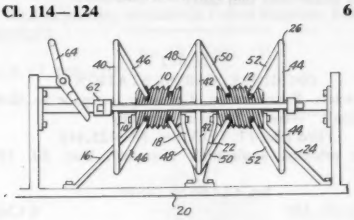
1. A protective device for a normally-folded gas bag of the type forming a ship's safety device, said bag being inflatable and deflatable by filling and removing a gas thereinto and therefrom and having a marginal edge portion extending along the periphery of the bag for mounting the bag on the broadside of a ship comprising, in combination, outwardly projecting fenders extending along the upper and lower sides of said bag in the cruising direction of said ship, means for mounting said fenders on said broadside with the corresponding marginal edge portion of said bag sandwiched therebetween, said fenders extending outwardly from said broadside to a distance in excess of said bag in the folded condition, outwardly projecting protective plates extending along the front and rear ends of said bag and means for mounting said protective plates on said broadside with the corresponding marginal edge portion of said bag sandwiched therebetween, said protective plates extending outwardly from said broadside to a distance in excess of said bag in said folded condition thereby providing with said fenders protection of said folded bag from damage.

3,916,810

STABILIZING MEANS FOR AIR OR WATER BORNE VEHICLES

Charlie L. Johnson, 1402 Rapides Ave., Alexandria, La. 71301

Filed Mar. 30, 1973, Ser. No. 346,696
Int. Cl. B63b *39/00*
U.S. Cl. 114—124 **6 Claims**



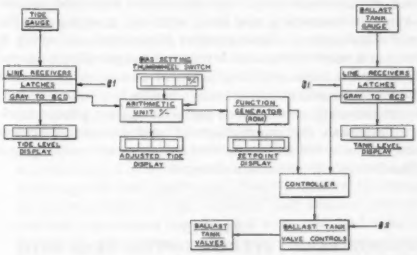
1. In a vehicle, stabilizer means comprising a pair of axially aligned, oppositely threaded screws, means fixedly securing said screws to the vehicle, a freely movable frame mounted coaxially of and surrounding said screws, flexible arms extending from said frame and having portions in driving engagement with the threads of said screws, said arms being directed at an angle to said screws and also being directed to intersect the common axis of the screws, said arms being flexibly deformable because of the inertia of the frame to develop a resistance to movement of the frame relative to the screws, whereby to inhibit such movement.

3,916,811

TIDE COMPENSATION SYSTEM

Stephen M. Fromnick, Wilmington, Del.; Ronald E. Jones, Tulsa, Okla., and Robert Mayer, Ardmore, Pa., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Aug. 29, 1974, Ser. No. 501,586
Int. Cl.[2] B63B *39/03*
U.S. Cl. 114—125 **7 Claims**



1. A method for automatically adjusting the ballast of a floating structure to compensate for changes in tide which comprises

a. measuring the tide level to obtain a digital signal,

b. measuring the water level in a ballast tank in said floating structure to obtain a digital signal, said ballast tank containing water inlet and outlet means controlled by valves,

c. electronically comparing said digital signals

d. using the difference from said digital signals beyond a preselected value to actuate said valves in said ballast

tank to permit entrance of or to expel water from said tank.

5. A floating structure capable of automatic compensation for changes in tide which comprises in combination with said structure

a. means to measure the tide level to obtain a digital signal,

b. means to measure the water level in a ballast tank in said floating structure to obtain a digital signal, said ballast tank containing water inlet and outlet means controlled by valves,

c. means to electronically compare said digital signals

d. means to employ any difference from said compared digital signals beyond a preselected value to actuate said valves in said ballast tank to permit entrance of or to expel water from said tank.

3,916,812
OFFSHORE MARINE STATION

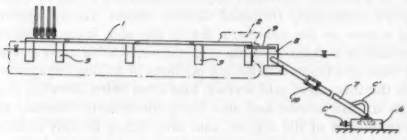
Bernd Bartels, Bremerhaven, Germany, assignor to Aktiengesellschaft "Weser", Bremen, Germany

Filed Dec. 17, 1973, Ser. No. 425,441

Claims priority, application Germany, Dec. 20, 1972, 2262240

Int. Cl.² B63B *21/00*

U.S. Cl. 114—230 **4 Claims**



1. An offshore marine station, comprising a floating mooring unit for marine vessels; an ocean-bottom anchor for said mooring unit; rigid elongated coupling means having one end jointed to said ocean-bottom anchor with freedom of movement in a plurality of directions, and a free end spaced from said one end, and extending from said ocean-bottom anchor upwardly toward said mooring unit at an acute angle to the horizontal; and buoyant damping means including a body of displacement floating partially immersed in water, first pivot means connecting said body with said coupling means for pivotal displacement about one horizontal axis, and second pivot means connecting said body with said mooring unit for pivotal displacement about another horizontal axis which is located at a vertically spaced level from but parallels said one axis, so that a horizontal displacement of said mooring unit with respect to said coupling means results in pivoting of said buoyant damping means about said axes against a force tending to establish the equilibrium of said buoyant damping means, whereby forces transmitted between said mooring unit and said coupling means are damped.

3,916,813
SIX-DEGREE OF FREEDOM TOWING GEAR WITH CONSTANT THRUST LINE TOWING FORCE

Ralph G. Stahl, 7307 Monticello Blvd., Springfield, Va. 22150

Filed Jan. 24, 1974, Ser. No. 436,319

Int. Cl.² B63B *21/64*

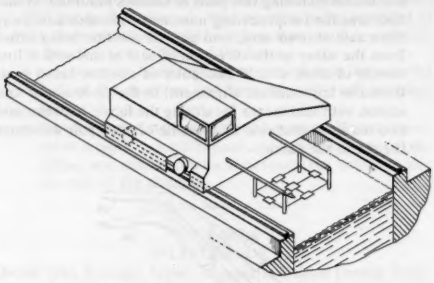
U.S. Cl. 115—6 **12 Claims**

1. A towing gear for a non-self propelled vehicle comprising:

a land-based towing carriage;

attachment means for attachment to said vehicle;

drive means coupled to said attachment means and to said carriage for imparting to said attachment means and thereby to said non-self propelled vehicle a constant force which is in line with the longitudinal axis of said vehicle



at all yaw, roll, and pitch angles and all heave, sway, and surge positions of said vehicle.

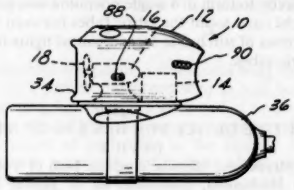
3,916,814
UNDERWATER PROPULSION DEVICES

Thomas J. Bardoni, 1605 Tenth, Wyandotte, Mich. 48192; William Markarian, 5970 Weddel, Taylor, Mich. 48180, and Kenneth O. Richardson, 15223 Thomas, Allen Park, Mich. 48101

Continuation-in-part of Ser. No. 267,679, June 29, 1972, abandoned. This application Sept. 4, 1974, Ser. No. 503,053

Int. Cl.² A63B *35/11*

U.S. Cl. 115—6.1 **14 Claims**



10. A device submerged in a liquid medium for propelling an object on or through the liquid medium comprising in combination:

a. a sealed, non-hydrogen emitting, rechargeable electrical power supply having a gelled electrolyte therewithin, whereby the need for disposing the power supply in a separate water-proof chamber is eliminated and the weight of the device is reduced,

b. a motor operatively connected to the power supply,

c. an impeller operatively connected to the motor, and wherein the power supply, motor and impeller are exposed to the liquid medium.

3,916,815
COLLAPSIBLE MARKER

Irvin L. Valley, 17106 NE. Second Place, Bellevue, Wash. 98008

Continuation-in-part of Ser. No. 235,292, March 16, 1972, abandoned. This application Jan. 24, 1974, Ser. No. 436,176

Int. Cl.² E01F *9/10*

U.S. Cl. 116—63 P **2 Claims**

1. A marker for an airport, comprising in combination;

a. a socket member arranged to be mounted in the ground,

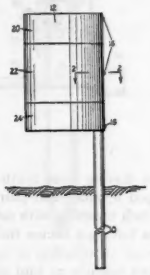
b. an upright support post having a structure which is sufficiently rigid to withstand wind forces and the like from aircraft but being sufficiently fragile to collapse when struck by an aircraft without causing damage to the aircraft,

c. a marker portion having a structure which is sufficiently rigid to withstand wind forces and the like from aircraft but being sufficiently fragile to collapse when struck by an aircraft without causing damage to the aircraft,

d. said marker portion being a hollow cylinder of bendable material with upper and lower ends open whereby said cylinder provides for a visible outer surface of 360° therearound,

e. said surface including a fluorescent band therearound for daytime use and a reflective band therearound for nighttime use,

f. said post projecting up into said marker portion through said open lower end of said cylinder,



g. securing means fastening said post to said marker portion along and inside from said upper to said lower end of said cylinder, and

h. a bushing mounted on said socket member for providing rotatable inter-engagement between said post and said socket member so that said post is rotatable about said post longitudinal axis whereby said marker portion upon subjection to associated wind forces will freely rotate to a position wherein said upper to said lower end of said cylinder to post securing means faces said associated wind forces.

3,916,816

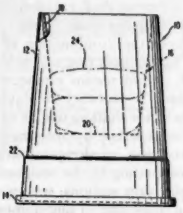
HIGHWAY MARKER

John C. Fitch, Falls Village, Conn., assignor to FIBCO, Incorporated, Hartford, Conn.

Continuation of Ser. No. 271,170, July 12, 1972, which is a continuation of Ser. No. 120,655, March 3, 1971, abandoned. This application Sept. 20, 1973, Ser. No. 399,048

Int. Cl. E01f *9/10*

U.S. Cl. 116—63 P **14 Claims**



1. A temporary highway safety marker comprising a generally upright frusto-conical main body portion having a lower edge adapted to rest, without attachment, on a supporting surface and an inverted frusto-conical container portion formed integrally with said body portion, said container portion being wholly within said main body portion and having a transverse bottom wall positioned substantially above the lower edge of said main body portion and substantially below the upper edge of said main body portion said container portion being adapted to contain a dispersible mass such as sand, and the walls of said body portion and said container portion diverging in a direction toward said lower edge of said body portion whereby said body portions may be nested in compact relation.

3,916,817

PRESSURE RESPONSIVE VISUAL WARNING DEVICES

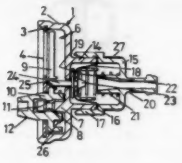
Stanley William Kemp, Southampton, England, assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 13, 1974, Ser. No. 442,164

Claims priority, application United Kingdom, Feb. 22, 1973, 8694/73

Int. Cl.² G01L *19/12*

U.S. Cl. 116—70 **3 Claims**

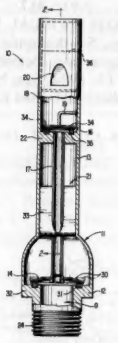


1. A pressure responsive visual warning device comprising: a housing having a substantially planar base and a side wall portion extending from said base; a front panel member secured to said side wall in overlying relation to said base and having an inspection window therethrough; an indicator disc pivotally mounted in said housing between said front panel and said base and movable between a first and a second operative position characterized by alignment of a warning indication on said disc with said inspection window when in its second operative position; a spring between said housing and said indicator disc tending to bias said disc to its second operative position; a retainer pin having a first end portion extending through an opening in said base and movable therein in an axial direction parallel to the pivotal axis of said indicator disc; said disc having an opening therein offset from its pivotal axis and coactive with a second end of the retainer pin to hold said pivotal disc in its first operative position against the force of said spring; said base having an annular wall portion extending therefrom on an opposite side from that of said side wall; a generally cup-shaped member cooperative with said annular wall to form a diaphragm chamber therebetween; a flexible diaphragm in said diaphragm chamber and being clamped at its outer peripheral edge between said annular wall portion and said cup-shaped member and being attached at its central portion to the second end of said pin retainer; diaphragm biasing spring means between said cup-shaped member and the central portion of said diaphragm tending to move said diaphragm toward said base to maintain engagement between said second end of the retainer pin and said opening in said disc; passage means between a source of fluid pressure and one side of said diaphragm to produce pressure forces in opposition to the force of said spring on said diaphragm to move said diaphragm and interconnected pin away from said indicating disc permitting said disc to pivot to its second operative position, thus aligning said inspection window and the warning indication on said indicator disc.

3,916,818
LOW AND HIGH PITCH STEAM WHISTLE

Katie H. Barr, 7121 Bull Run Post Office Road, and Wesley O. Niccolls, 7015 Centreville Road, both of Centreville, Va. 22020

Filed Sept. 12, 1974, Ser. No. 505,230
Int. Cl.[2] G01L *19/12*
U.S. Cl. 116—70 **4 Claims**



1. A steam activated whistle means for use with a pressure cooker or the like, comprising: a hollow column defining an upper and lower chamber separated by a wall extending transversely across the upper portion of the column, said lower chamber having a greater volume than said upper chamber; a first pop-off valve operatively located in said lower chamber and a second pop-off valve operatively located in said upper chamber, said second valve being in fluid communication with the lower end of the column through a channel extending longitudinally through said column, said second valve being operable to allow steam to pass at a preselected lower pressure than said first valve; a pair of arch-shaped steam outlet orifices, one of said orifices being located in the wall of said column adjacent each of said chambers; a pair of plug members to selectively restrict passage of steam through said column, one of said plug members being mounted on the inner wall of said column opposite each of said steam outlet orifices; and means for connecting the lower end of said column to said pressure cooker.

3,916,819
CHANNEL INDICATOR DEVICE FOR TELEVISION RECEIVING SETS

Akira Yokosuka, Fujisawa, Japan, assignors to Matsushita Electric Industrial Co. Kadoma, Japan

Claims priority, application Japan, Dec. 28, 1971, 46-359
Filed Dec. 27, 1972, Ser. No. 318,982
Int. Cl. H03j *1/02*
U.S. Cl. 116—124.1 **1 Claim**

1. A channel indicating device for a television receiver having a channel selecting tuner comprising

a. a circular indicating member having channel members arranged in a spiral configuration on the front face thereof, a spiral groove on the backside thereof, and an elongated hole through its center of rotation;

b. a collar provided on said indicating member surrounding said center of rotation;

c. a fixed positioning pin slidably engaging the spiral groove in said indicating member;

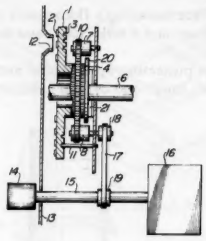
d. a first shaft extending through the elongated hole in said indicating member;

e. a second shaft connected to said channel selecting tuner;

f. means for operatively connecting said indicating member to said second shaft, said means comprising:

1. a gear integrally secured to the center of the backside of said indicating member,

2. a pair of rotary drums operatively connected to said second shaft, and



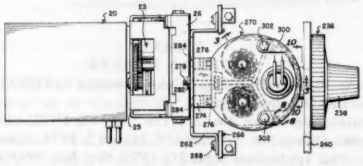
3. a driving belt having gear teeth on the outer surface thereof engaged around said pair of rotary drums, the teeth on said belt meshing with said gear; and

g. guiding means having a recess therein for receiving said collar, the center of rotation of said indicating member being translated linearly as said second shaft is rotated, said indicating member being guided by said guiding means.

3,916,820
ELONGATED STRIP TYPE INDICATOR ARRANGEMENT FOR UHF TELEVISION TUNER

Alarico A. Valdettaro, Bloomington, Ind., assignor to Sarkes Tarzian, Inc., Bloomington, Ind.

Filed May 30, 1972, Ser. No. 257,846
Int. Cl.[2] H03J *01/02, 05/06*
U.S. Cl. 116—124.2 R **14 Claims**



1. In a UHF tuning mechanism of the type having a continuously variable main tuning shaft rotation of which is effective selectively to receive signals from all television stations in the UHF television band, the combination of a station selector shaft, gear means interconnecting said selector shaft and said main tuning shaft, detent means connected to said selector shaft for establishing a plurality of equally spaced detent positions for said selector shaft so that all of the stations in said UHF band may be selected by rotating said selector shaft more than one revolution, an elongated strip of material bearing numbers corresponding to the assigned channels of each of the 70 UHF television stations, means defining a viewing position at which a single one of said numbers may be viewed, driving means for moving said elongated strip past said viewing position, and means interconnecting said selector shaft and said driving means, said numbers being spaced at equal intervals along the length of said strip so that the number on said elongated strip which corresponds to each stop position of said main tuning shaft is selectively moved to said viewing position in response to rotation of said selector shaft and is positioned in correct registration with said viewing position by said selector shaft detent means.

3,916,821
MAGNETIC MARKER ASSEMBLY

Othmar W. Pies, 200 W. Galbraith Road, Cincinnati, Ohio 45215

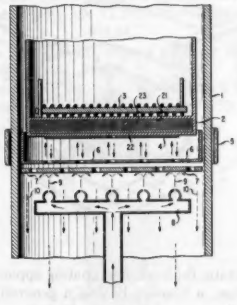
Filed June 19, 1972, Ser. No. 264,179
Int. Cl.[2] G01C *15/06, 15/04*
U.S. Cl. 116—114 R 6 Claims

1. A marker assembly which comprises an elongated upright driveable stake of magnetic responsive material and a marker member mounted on an upper portion of the stake, the marker member including a permanent magnet and a housing surrounding the magnet, there being an elongated upright socket in the housing receiving the upper portion of the stake, the magnet being exposed in the socket and engaging an upper end of the stake.

3,916,822
CHEMICAL VAPOR DEPOSITION REACTOR

McDonald Robinson, Chester, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 26, 1974, Ser. No. 464,478
Int. Cl.[2] C23C *13/08*
U.S. Cl. 118—49 6 Claims

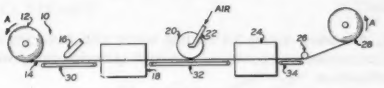


1. Chemical vapor deposition apparatus for depositing a layer of a substance on a surface of a substrate comprising
means for supporting said substrate,
means for introducing at least one gas producing said substance into a zone adjacent to said surface,
means for extracting any residual gaseous material, and
means for uniformly maintaining said substrate at a temperature higher than that of said introduced gas characterized in that
1. said surface generally defines the upper extremity of said zone,
2. said surface faces in a downward direction,
3. the lower extremity of said zone is generally defined by a radiation shield permeable to reactant, carrier and product gases, and
4. means are provided for introducing said gas at a position below said radiation shield.

3,916,823
PATTERN EMBOSSING OF FLOCKED FABRIC

John B. Halloran, Somerset, Mass., assignor to United Merchants and Manufacturers, Inc., New York, N.Y.

Division of Ser. No. 317,816, Dec. 22, 1972. This application July 18, 1974, Ser. No. 489,670
Int. Cl.[2] B05C *1/10*
U.S. Cl. 118—63 5 Claims



1. An apparatus for producing a patterned effect in a laminate composed of a substrate having raised fibers secured thereto by an adhesive binder comprising:
a. a substrate delivery station;
b. a patterned laminate receiving station;
c. conveying means operatively related to said substrate and said stations for moving the substrate from the delivery station to the receiving station;
d. coating means operatively mounted between said stations for applying a binder to the substrate;
e. raised fiber application means operatively mounted subsequent to the coating means for applying raised fibers to the coated substrate;
f. binder setting means operatively mounted subsequent to the raised fiber application means for permanently setting the binder; and
g. fiber orienting means operatively mounted between the raised fiber application means and the binder setting means for orienting the raised fibers on said substrate in a pre-determined pattern, said fiber orienting means including a cylindrical stencil rotatably mounted above and in close proximity to the raised fibers on said substrate, means for directing air, under pressure, through the open portions of the stencil and against the raised fibers, and means in driving relation for rotating the stencil, wherein the air directing means comprises at least one tube mounted within the cylindrical stencil, the tube being disposed parallel to the longitudinal axis of the stencil and having an air exit therein, and the tube being positioned so that the air exit faces towards the raised fibers and wherein the tube has an air inlet pipe connected thereto for introducing air into said tube, the other end of the air inlet pipe being open to the atmosphere, said pipe having an air inlet disposed between the ends thereof and adapted for directionally introducing air under pressure into said pipe at an angle away from the open end thereof, the air inlet having a venturi conformation creating a vacuum in said pipe such that air from the atmosphere is drawn into the open end of the pipe.

3,916,824
DEVICE FOR COATING STRIP MATERIAL IN CONTINUOUS OPERATION

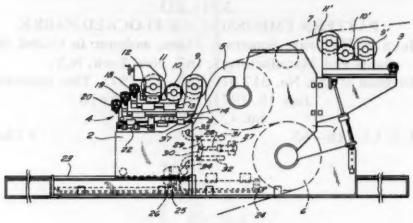
Peter Knodel, Leonberg; Gerhard Mayer, Leinfelden; Horst Munsterer, and Reinhold Wagner, both of Neuss, all of Germany, assignors to Aluminium Norf GmbH, Neuss, Germany

Filed Aug. 23, 1974, Ser. No. 500,073

Claims priority, application Germany, Aug. 29, 1973, 2343431

Int. Cl.[2] B05C *1/00*

U.S. Cl. 118—224 **11 Claims**



1. A coating device for coating bands with a coating material in continuous operation, said coating device comprising in combination:

a main stationary mounted frame structure;

rotary guide means for guiding band material to be coated, said guide means including at least one deflector roller and being mounted on said main frame structure;

a coating assembly for coating the side of the band outwardly facing on said roller, said assembly including a fountain roll for supplying coating material, a metering roll and an applicator roll disposed in axially parallel relationship one with the other and the deflector roller;

an auxiliary frame structure supporting said coating assembly, said auxiliary frame structure including guide means for slidably guiding said coating assembly as a unit in the direction normal to the rotary axis of the deflector roller for selecting varying positions of said assembly relative to said roller;

guide means on said main frame structure slidably supporting said auxiliary frame structure for selectively displacing the same in the direction normal to the axis as a unit relative to the main structure and thus relative to the deflector roller;

drive means for moving said auxiliary frame structure into a predetermined position relative to the main frame structure; and

locking means coacting with said auxiliary frame structure for releasably locking the same to the main frame structure.

3,916,825
APPARATUS FOR COATING FIBERS WITH BINDER TO PRODUCE FIBERBOARD

Erwin Schnitzler, Karlsruhe, and Ulrich Schnitzler, Reichenbach, both of Germany, assignors to E. Schnitzler GmbH & Co., Karlsruhe, Germany

Filed Dec. 17, 1973, Ser. No. 425,135

Claims priority, application Germany, Dec. 15, 1972, 2261598

Int. Cl.[2] B05C *5/00*

U.S. Cl. 118—303 **4 Claims**

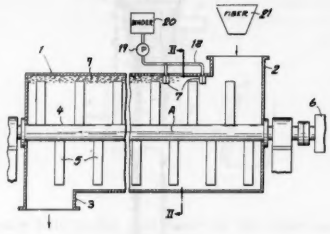
1. An apparatus for coating fibers with a binder, said apparatus comprising:

a drum having an axis and an axially spaced inlet and outlet;

an arbor extending axially in said drum and having axially spaced radially extending arms with ends adjacent the inner wall of said drum;

at least one baffle on said inner wall between axially spaced arms having a height in a radial direction and a length in a tangential direction, each many times greater than the average length of said fibers, said baffle having a pair of sides inclined to the direction of displacement of said fleece thereby and terminating in a common apex pointing opposite this displacement direction;

means for relatively rotating said arbor and said drum with said ends of said arms sweeping said inner wall for displacing said fibers from said inlet to said outlet as a fluid



fleece lying in a layer of limited thickness along said wall and forming a dead-fluid region in back of said baffle;

at least one nozzle on said inner wall of said drum in said dead fluid region directly in back of said baffle and between said sides; and

means for introducing binder into said drum through said nozzle, said fleece being advanced at a rate to form a vortex street in back of said dead-fluid region, said binder being injected at a volume rate per unit time equal to generally half the rate sufficient to eliminate said vortex street.

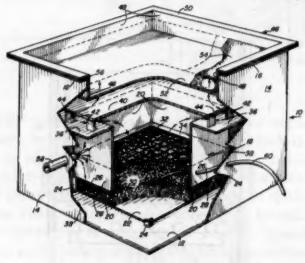
3,916,826
ELECTROSTATIC COATING APPARATUS

Walter Ganter Knudsen, Bethany, Conn., assignor to Electrostatic Equipment Corporation, New Haven, Conn.

Filed Sept. 18, 1973, Ser. No. 398,425

Int. Cl. B05b *5/02*

U.S. Cl. 118—629 **31 Claims**



1. Electrostatic fluidized bed coating apparatus comprising, in combination, a housing having a generally planar porous support member mounted therein to define within said housing a fluidization chamber thereabove and a plenum therebelow; and high efficiency gas ionizing means so disposed as to furnish to said plenum highly ionized gas, said ionizing means being spaced from said support member by a minimum distance of about 7.5 centimeters, as measured along the most direct gas flow path defined therebetween, so that ionized gas from said ionizing means passes from said plenum through said support member and into said fluidization chamber to fluidize and efficiently electrostatically charge particulate

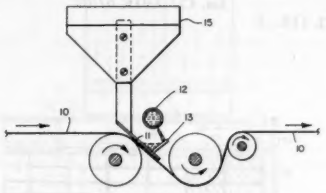
material supplied thereto, with said minimum spacing effectively isolating said ionizing means to avoid, under normal operating conditions, the passage of a substantial current therefrom to an effectively oppositely charged member disposed in said fluidization chamber.

3,916,827

PERFORATE DEVELOPMENT ELECTRODE

Clyde P. Grant, Gorham; Merton A. Look, Westbrook, and Richard M. Lowe, South Portland, all of Maine, assignors to Scott Paper Company, Philadelphia, Pa.

Filed Mar. 7, 1973, Ser. No. 338,905
Int. Cl.² G03G *15/10*
U.S. Cl. 118—637 **6 Claims**



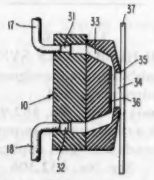
1. Apparatus for developing electrostatic images on a sheet of electrophotographic copy material comprising
1. a flat perforate development electrode;
2. means for conveying the image side of the copy material in close proximity with and facing the development electrode and;
3. means for flowing liquid toner uniformly through the perforate electrode on to the image side of the sheet without contacting the side opposite the image side, the means for flowing liquid toner uniformly comprising
   a. pressure reducing means disposed adjacent to the electrode; and
   b. spray means for directing liquid toner against the pressure reducing means so as to cause toner to accumulate in the space formed between the pressure reducing means and the electrode.

3,916,828

APPARATUS FOR DEVELOPING AN ELECTROSTATIC LATENT IMAGE ON AN ELECTROPHOTOGRAPHIC FILM

Frank C. Gross, Wilbraham, Mass., assignor to Scott Paper Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 349,452, April 9, 1973. This application Apr. 8, 1974, Ser. No. 459,195
Int. Cl.² B05B *5/02*
U.S. Cl. 118—637 **5 Claims**



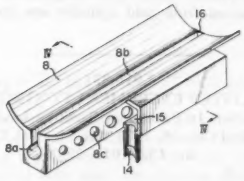
1. An apparatus for developing an electrostatic latent image on an electrophotographic film comprising:
a developing chamber forming a passageway through which electrostatically charged toner particles are conducted to contact the film, the chamber having an opening bordered by a mask against which the film is placed to form a seal, an inlet through which toner particles and air enter the chamber, and an outlet through which toner particles and air leave the chamber;
supply means for providing toner particles to be passed through the chamber;
toner flow control means for permitting a predetermined quantity of toner particles to flow through the developing chamber at predetermined times;
air supply means for supplying drying air to the inlet of the chamber; and
vacuum means connected to the outlet of the chamber for drawing the toner particles and the air through the chamber, the vacuum means creating sub-atmospheric pressure within the chamber to prevent leakage of toner particles from the chamber around the film.

3,916,829

DEVICE FOR LIQUID DEVELOPMENT

Katuhiko Yamada, Yokohama, and Yusaku Takada, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 6, 1974, Ser. No. 467,483
Claims priority, application Japan, May 11, 1973, 48-52381
Int. Cl.² G03G *15/10*
U.S. Cl. 118—637 **4 Claims**



1. A developing device for developing, with a liquid developing agent, an electrostatic image formed on an image bearing member, comprising:
an electrode for development;
a reservoir for the developing agent;
slit well-up means for welling up the developing agent, said means being formed on said electrode and having closed ends;
means for controlling the flow of the developing agent, said controlling means being located adjacent said slit well-up means and including a storing sump for the liquid developing agent and a plurality of openings communicating the storing sump with said slit well-up means, the openings directing the liquid developing agent from the storing sump in a direction different from the well-up direction of the liquid developing agent at the slit of said well-up means; and
means for feeding the liquid developing agent from said reservoir to said controlling means.

3,916,830

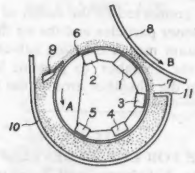
MAGNETIC BRUSH DEVELOPER

Motoki Kojima, Hino; Nin-ichi Kamogawa, Tokyo, and Haruo Fujii, Mitaka, all of Japan, assignors to Konishiroku Photo Industry Co. Ltd., Tokyo, Japan

Continuation of Ser. No. 256,801, May 25, 1972, abandoned. This application Aug. 15, 1974, Ser. No. 497,523
Claims priority, application Japan, May 26, 1971, 46-42359
Int. Cl.² G03G *13/08*
U.S. Cl. 118—637 **7 Claims**

1. In an apparatus for developing an electrostatic latent image, comprising a magnetic brush formed on a cylindrical member and disposed within a trough, a particulate developer comprising a magnetic carrier and a toner disposed in said trough, said cylindrical member partially immersed in said developer, means for rotating said cylinder, means for passing

a latent image carrier in proximity to and in contact with the brush thereby developing said image, and scraping means for removing residual developer from said cylindrical member for return to said trough after development, said scraping means being located downstream of the zone of image development and extending along the longitudinal extent of said cylinder, the improvement which comprises said scraping means comprising a scraping plate extending upwardly and along said

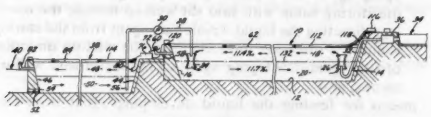


longitudinal extent and having a linear front edge in close proximity to said cylinder thereby adapted to remove the residual developer, said scraping means further comprising a plurality of transversely directed and oppositely inclined guide elements extending from the rear edge of said scraping plate for moving at least a part of the scraped residual developer axially of said cylinder whereby the magnetic carrier and toner particles removed from said cylinder are more uniformly mixed.

3,916,831
ANIMAL LITTER EXCREMENT CONTROL SYSTEM
Stanton E. Fisher, 16 Brentmoor Park, St. Louis, Mo. 63105
Filed Oct. 20, 1971, Ser. No. 191,122
Int. Cl.[2] A01K *29/00*
U.S. Cl. 119—1 **8 Claims**

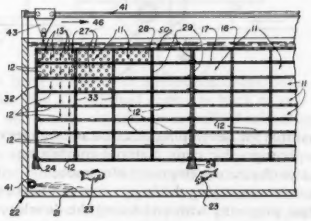
1. An animal litter excrement control system comprising a composition of popcorn in the popped or effloresced state together with one or more other conventional animal litter ingredients including clays or chlorophyl-containing grasses.

3,916,832
AQUACULTURE SYSTEM
Maxwell Patrick Sweeney, 1817 Fanning St., Los Angeles, Calif. 90026
Filed Apr. 16, 1973, Ser. No. 351,545
Int. Cl.[2] A01K *61/00*
U.S. Cl. 119—2 **33 Claims**



1. A method of aquaculture of a carnivorous aquatic non-air breathing species in a generally enclosed body of water, which comprises establishing an aqueous euphotic zone containing phytoplankton in said body of water above an aqueous bottom zone, providing nutrients in said euphotic zone sufficient to cause growth of phytoplankton at a rate of at least about 2 grams of carbon per square meter per day, disposing a filter-feeding aquatic non-air breathing species in said body of water which will feed upon said phytoplankton and upon which said carnivorous species will feed, introducing said carnivorous species into said body of water, the excreta from said carnivorous and filter-feeding species providing at least a portion of said nutrients to said phytoplankton, said phytoplankton at least in part providing the food for said filter-feeding species, and protoplasm of said filter-feeding species at least in part providing the food for said carnivorous species, establishing a waterdriven upwelling movement of water in said body of water from within said bottom zone by introducing water into said bottom zone such that water in said bottom zone is moved upwardly to within said euphotic zone to recirculate nutrients from the bottom zone to the euphotic zone for reconversion therein by the phytoplankton, thereby generating oxygen and eliminating the toxicity of excreta to said carnivorous species, removing water from said euphotic zone near the surface thereof, and harvesting members of said carnivorous species which have grown to a desirable size.

3,916,833
AQUEOUS CRUSTACEAN CULTURE SYSTEM
Steven A. Serfling, 1314 L St., Davis, Calif. 95616
Filed Mar. 4, 1974, Ser. No. 448,082
Int. Cl.[2] A01K *61/02*
U.S. Cl. 119—2 **7 Claims**



1. An array of vertically superimposed compartments adapted for submersion in water and each sized to house, and each having a bottom adapted to support, a crustacean;

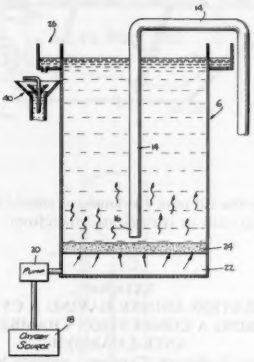
each said bottom being subdivided into contiguous particle-retaining and particle-passing areas, each of said particle-passing areas being formed for support of a crustacean and for conjoint gravitation therethrough of food particles and animal waste, said particle-retaining areas being each formed for support of food and animal waste particles;

said particle-retaining areas at different levels being horizontally offset one from the other and collectively providing when viewed in plan a substantially complete coverage of the horizontal dimensions of said array, whereby heavier-than-water food particles distributed onto the water surface overlying said array will gravitate into distributed portions on said particle-retaining areas.

3,916,834
FISH HUSBANDRY SYSTEM
Keen W. Buss, Boalsburg, Pa., assignor to Marine Protein Corporation, Londonderry, N.H.
Continuation-in-part of Ser. No. 162,910, July 15, 1971, abandoned, which is a continuation-in-part of Ser. No. 16,830, March 5, 1970, abandoned. This application Jan. 10, 1974, Ser. No. 432,306
Int. Cl.[2] A01K *61/00*
U.S. Cl. 119—3 **10 Claims**

1. A method of rearing fish at high density in a controlled environment, characterized by the steps of confining the fish during their period of growth in at least one vertically extending space the ratio of height to width of which is about 3 to 1 and which contains a body of water at or near oxygen saturation level, continuously supplying water at or near oxygen

saturation level to the bottom of said space, and continuously overflowing used water at the top of said space, the flow of



water through the space being a quiescent substantially unidirectional upward laminar flow of about 1 foot per minute.

3,916,835

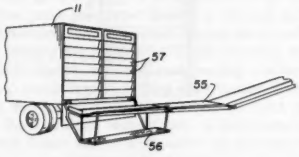
POULTRY CONVEYING SYSTEM

Frank N. Reynolds, Auburn, Maine, assignor to Poultry Transaire Systems, Inc., St. Lewiston, Maine

Filed Nov. 7, 1973, Ser. No. 413,613

Int. Cl.[2] A01K *29/00*

U.S. Cl. 119—12 **11 Claims**



1. A poultry conveying system comprising an enclosed compartment having an opening at one end, a plurality of vertical tiers within said compartment, a belt conveyor disposed along the bottom of each tier, a small diameter roller between the upper and lower reaches at the end of each belt conveyor adjacent to said opening, said roller being mounted for rotation about an axis transverse the longitudinal axis of said belt conveyor, support and drive means coupled to said belt conveyor to effect movement along the path defined by said belt conveyor, at least one linked chain belt mounted about sprocket means and disposed vertically along said one end of said compartment, an external conveyor, a coupling element on said chain belt for coupling to said external conveyor, and a drive shaft coupled to said sprocket means, whereby said external conveyor is selectively positioned at horizontal levels corresponding to the location of each of said tiers.

3,916,836

METHOD AND APPARATUS FOR ERECTING OR BUILDING AND HOUSING OR CONTAINING SMALL ANIMALS OR BIRDS

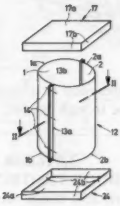
Fritz Jüstl, Rheinstrasse 10, D-6051 Dietzenbach-Steinberg, Germany

Filed May 7, 1973, Ser. No. 357,691

Claims priority, application Germany, May 5, 1972, 2221973

Int. Cl. A01k *1/00, 31/00*

U.S. Cl. 119—17 **36 Claims**



1. A housing or the like for animals, birds and the like, the housing comprising:

an elongated tube formed from a plurality of joined wall elements, the tube having a closed boundary contour formed of a plurality of discontinuous arcs, each arc being formed of at least one complete wall element; the junctions of adjoining arcs comprising the joints of two wall elements, the junctions of adjoining arcs each forming a straight line parallel to each other and perpendicular to the symmetry line of the tube; each wall element being formed of a bent sheet of material, the sheet being bent so as to have a curvilinear cross section, each element having two curved parallel front surfaces and two longitudinal edges, each element being releasably joined to an adjacent element at each longitudinal edge; and

a hood-shaped cover having a top enclosing surface, covering the top end of the elongated tube, and a plurality of straight side surfaces extending around the entire perimeter thereof, the side surfaces extending towards the tube and being substantially parallel to the axis of said tube; each wall element being in contact with at least one of said straight side surfaces, the contact being solely tangential, line contact along a line parallel to the axis of the tube member; the boundary contour of the cover forming a straight-sided polygon.

3,916,837

BAFFLE FOR TROUGH FEEDER

Robert A. Murto, Goshen, Ind., assignor to Chore-Time Equipment, Inc., Milford, Ind.

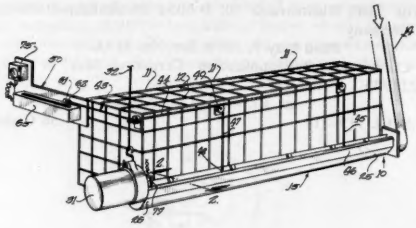
Filed Mar. 18, 1974, Ser. No. 451,768

Int. Cl.[2] A01K *31/00*

U.S. Cl. 119—18 **8 Claims**

1. In a trough feeder for poultry and the like, the trough including a feed-retaining trough bottom and an open top through which the poultry can reach the feed, and the feeder further including means for depositing feed along the trough bottom, the improvement comprising poultry shield means alternatively movable into a closed position to prohibit the poultry from reaching the feed as feed is being deposited on the trough bottom, and movable into an opened position to permit the poultry to reach the feed after a quantity of feed

has been so deposited on the trough bottom, and means for moving the shield between said opened and closed positions



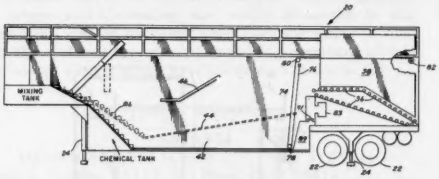
in response to the presence or absence of feed at a predesignated location in the trough feeder.

3,916,838
DOOR PROTECTOR
Geraldine Ann Swart, 250 Ridge Ave., Evanston, Ill. 60202
Filed Feb. 26, 1974, Ser. No. 446,028
Int. Cl.² A01K *15/00*
U.S. Cl. 119—29 **3 Claims**

1. A flexible door protector panel adapted to be removably suspended from a door knob for protecting the door finish from damage caused from pets which leap and claw at doors comprising; an oblong panel provided with an opening at the top center thereof, said opening defining a lower circular portion large enough to accommodate a door knob and an upper slot portion rounded off at the upper end thereof, said flexible panel being collapsible for storage when not in use and extensible for door protection when suspended from a door knob, a graphic design printed on the face of said panel comprising stylized art work compatible with the animal deterrent concept such as a humorous constumed dog with a paw raised in a command signal and a line of copy such as "Down Boy" or "Cool it Pardner".

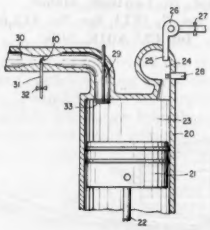
3,916,839
STOCK DIPPING APPARATUS
Francis W. Hewes, Jr., Toponas, Colo. 80479
Filed May 9, 1974, Ser. No. 468,466
Int. Cl.² A01K *13/00*
U.S. Cl. 119—158 **40 Claims**

1. Apparatus for dipping animals comprising:
an elongated dipping vat through which an animal is adapted to swim, said vat having an upwardly inclined exit end through which the animal may emerge;
a ramp up which an animal moves into the vat;
barriers at each side of the conveyor, at least one being swingable to form a convergent throat therebetween; and means for swinging same to capture an animal therebetween, whereby a captured animal is prevented from



entering the vat until a submerged animal ahead of same in the vat exits or is extricated therefrom.

3,916,840
COMBUSTION ENGINE HAVING A CYLINDER COMPRISING A COMBUSTION CHAMBER AND AN ANTE-CHAMBER
Istvan Geiger, Wolfsburg, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany
Filed Aug. 27, 1971, Ser. No. 175,560
Claims priority, application Germany, Sept. 17, 1970, 2045874
Int. Cl.² F02B *19/10, 19/18*
U.S. Cl. 123—32 ST **6 Claims**



1. In a motor vehicle, an engine having a plurality of cylinders, each of said cylinders comprising a combustion chamber having an inlet valve means connected to a carburetor means for the feeding of a fuel-air mixture to said combustion chamber and an ante-chamber communicating with said combustion chamber, said ante-chamber having an injection nozzle means associated therewith for feeding fuel into said ante-chamber and a spark-plug having electrodes terminating in said ante-chamber, means for controlling said carburetor means for feeding said mixture at partial brake loads of said engine on a range between a minimum and a maximum filling of said chambers and providing operating of said engine at brake loads below said partial brake loads by controlling the amount of mixture fed to said chambers, and means actuating said injection nozzle means when said partial brake loads go over to higher brake loads by controlling the amount of fuel fed by said fuel injection nozzle means, said control means of said carburetor means remaining effective at a maximum filling position during said higher brake loads:

3,916,841

STEAM GENERATOR FOR A PRESSURIZED-WATER COOLANT NUCLEAR REACTOR

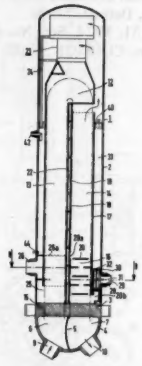
Heinz-Jurgen Schroder, and Wolfgang Berger, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Dec. 14, 1973, Ser. No. 424,691

Claims priority, application Germany, Dec. 22, 1972, 2263165

Int. Cl. F22b *1/06*

U.S. Cl. 122—32 7 Claims



1. A steam generator for a pressurized-water coolant nuclear reactor, said generator having a vertical substantially cylindrical housing having a steam output outlet, a horizontal tube sheet closing the lower end of said housing, an inverted U-shaped tube bundle inside of said housing and having vertical inlet and outlet legs with their ends mounted in said tube sheet with the latter having therebeneath inlet and outlet manifolds for said ends respectively, a feed-water preheater enclosing the lower end of said outlet leg and having a feed-water inlet and a preheated feed-water outlet, said housing having an externally supplied feed-water inlet connecting with said preheater's inlet, a cylindrical shroud peripherally enclosing said tube bundle and into which said preheater's outlet discharges upwardly, said shroud forming an annular feed-water descent space between it and said housing and opening to said tube sheet for feed-water ascent through said shroud, and a steam-water separator positioned in said housing above said shroud and having an inlet for receiving a steam-water mixture therefrom and having a steam outlet connecting with said steam output outlet and a separated feedwater outlet connecting with said descent space; wherein the improvement comprises means for individually enclosing said inlet leg with an upper end connected with said separator's steam outlet and a lower end connected with said steam output outlet, means for individually enclosing said outlet leg with a lower portion connected with said preheated feed-water outlet of the preheater and at an upper end connected with said steam-water mixture inlet of the water separator, and means for pumping downwardly to said preheater's feed-water inlet a flow of feed-water from said descent space.

3,916,842

FUEL INJECTION APPARATUS FOR INTERNAL COMBUSTION ENGINES

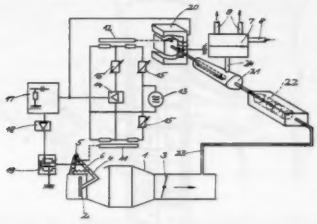
Heinrich Knapp, Leonberg-Silberberg, and Reinhard Schwartz, Stuttgart-Sillenbuch, both of Germany, assignors to Robert Bosch, GmbH, Stuttgart, Germany

Continuation of Ser. No. 190,002, Oct. 18, 1971. This application Aug. 13, 1973, Ser. No. 387,816

Claims priority, application Germany, Oct. 21, 1970, 2051584

Int. Cl.[2] F02M *39/00;* F02B *3/00*

U.S. Cl. 123—32 EA 15 Claims



1. In a fuel injection apparatus associated with an internal combustion engine including an air intake tube and an arbitrarily displaceable butterfly valve disposed therein, said apparatus being of the type that includes (a) an air sensor disposed in said air intake tube upstream of said butterfly valve and adapted to be deflected to an extent proportionate to the air quantities flowing through said air intake tube, (b) a spring connected to said air sensor for exerting thereon a substantially constant return force opposing the deflection of said air sensor, (c) a fuel metering valve for determining the fuel quantities to be injected into said internal combustion engine, (d) a setting device operatively connected to said air sensor and to said fuel metering valve for controlling the latter as a function of the extent the air sensor is deflected, the improvement comprising an electric follower regulator circuit including

A. means for applying a voltage to said regulator circuit,

B. a first signal transmitter connected to said air sensor for applying to said regulator circuit a signal representing the extent of deflection of said air sensor,

C. a second signal transmitter connected to said setting device for applying to said regulator circuit a signal representing the position of said setting device,

D. means for forming a signal representing the difference between the two signals defined in (B) and (C) and

E. means for applying the signal defined in (D) to said setting device.

3,916,843

BUFFER ZONE FOR COUNTERFLOW PREHEATER

Robert R. Bennett, Tampa, Fla., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 15, 1974, Ser. No. 433,615

Int. Cl. F22b *1/06*

U.S. Cl. 122—32 9 Claims

1. A vapor generator which utilizes a primary heated fluid to vaporize a secondary fluid, said vapor generator comprising a vertical shell portion; a tubesheet disposed adjacent one end of said shell; a tube bundle formed from a plurality of tubes through which said primary fluid flows; a wrapper encircling said tube bundle and forming an annular chamber between said wrapper and said shell, a secondary fluid inlet nozzle; a preheater in fluid communication with said secondary fluid inlet nozzle and having an end closure plate disposed in a spaced relationship with said tubesheet; a flow distribution plate disposed between said end closure plate and said tubesheet; said flow distribution plate having a plurality of circula-

tion openings disposed therein; said flow distribution plate being cooperatively associated with said end closure plate and said wrapper to form a buffer zone between said end closure

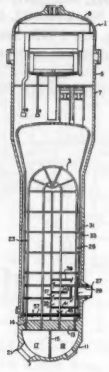


plate and said flow distribution plate, said buffer zone preventing influent secondary fluid that is introduced into the preheater from channeling along the tubes and contacting the tubesheet.

3,916,844

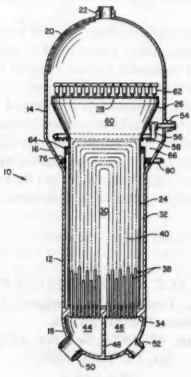
STEAM GENERATOR BLOWDOWN APPARATUS

Don Stuart Cassell, Chattanooga, Tenn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed July 29, 1974, Ser. No. 492,646

Int. Cl. F22b *37/54*

U.S. Cl. 122—32 **9 Claims**



1. In a shell and tube heat exchanger for the generation of vapor by the indirect transfer of heat from a heating fluid to a secondary liquid including a pressure shell having a transverse tube sheet defining a vapor generating region enclosing a bundle of heat exchange tubes emanating from said tube sheet, means for passing heating fluid through said tubes and means for circulating said secondary liquid through said vapor generating region exteriorly of said tubes, the improvement comprising means for the removal of suspended particulate material from said circulating secondary liquid, said means including:

a. baffle means defining a settling chamber forming a low liquid flow velocity region within the interior of said pressure shell;

b. said settling chamber having an opening for the reception of secondary liquid flowing within said vapor generating region and defining a flow path in which said secondary liquid undergoes an abrupt change of direction; and

c. a blowdown pipe operatively disposed in said settling chamber and communicating with the exterior of said pressure shell for the discharge of settled particulate material from said settling chamber.

3,916,845

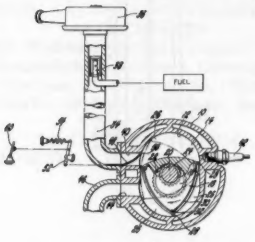
INTERNAL COMBUSTION ROTARY ENGINE

Klomp Edward D., Mount Clemens, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 31, 1974, Ser. No. 474,893

Int. Cl.² F02B *53/06*

U.S. Cl. 123—8.45 **2 Claims**



1. An internal combustion rotary engine comprising a housing having a pair of inner end walls and an inner peripheral wall defining a cavity, a rotor disposed in said cavity, crankshaft rotatably supported by said housing and having an eccentric rotatably supporting said rotor, said rotor and said walls cooperatively providing a plurality of variable volume chambers that are spaced around the move with said rotor while varying in volume as said rotor and said crankshaft turn, said housing having a peripheral intake port extending through said peripheral wall in a location so as to periodically open to said chambers as said chambers expand to deliver an air-fuel mixture thereto and is then closed to said chambers as they contract to compress the air-fuel mixture, means for igniting the compressed air-fuel mixture in said chambers, said housing having an exhaust port extending through one of said walls in a location so as to periodically open to said chambers as they contract in an exhaust phase following an expansion or power phase, and a flexible vane slidably mounted in a curved groove in opposite sides of said peripheral intake port extending transverse to the flow direction through said intake port, said vane having an exit edge that is positionable by sliding vane movement at the exit of said intake port to reduce the normal overlap between said intake and exhaust ports while said groove flexes said vane to form a narrowed flow area along a curved path that directs flow at an increased velocity into said chambers in the direction of rotor rotation, said vane being further positionable in said groove to restore the normal overlap while continuing to provide a narrowed flow area along a curved path for directing the intake flow at increased velocities into said chambers in the direction of rotor rotation and being further positionable to fully open said intake port.

3,916,846
SIDE INTAKE FOR A ROTARY INTERNAL COMBUSTION ENGINE

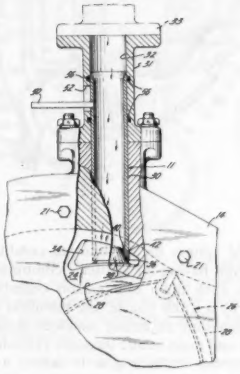
Gunter Kromer, Heilbronn, Germany, assignor to Audi NSU Auto Union Aktiengesellschaft, Neckarsulm and Wankel G.m.b.H., Lindua, Bodensee, both of, Germany

Filed May 30, 1974, Ser. No. 474,667

Claims priority, application Germany, July 18, 1973, 2336489

Int. Cl.[2] F02B *53/06*

U.S. Cl. 123—8.45 **4 Claims**



1. An improved fuel and air intake assembly for a rotary internal combustion engine having a housing forming at least one cavity within which a rotor is supported for planetary movement and which rotor defines with the housing a plurality of working chambers which successively expand and contract in volumetric size as the rotor rotates within said cavity, the fuel and air intake assembly comprising:

a. a side intake port means in the housing;

b. an intake passageway in the housing communicating at one end with said side intake port means and at the opposite end with a source of combustible gaseous mixture;

c. a variable throttle-valve means disposed upstream of said side intake port means and in relatively close spaced relation to said side intake port means;

d. said throttle-valve means including a linearly movable open ended hollow member axially slidable within said intake passageway, a fixed member disposed to extend into one end of said hollow member to define with said one end a restricted passage to receive and accelerate said combustible gaseous mixture flowing from said source thereof to the side intake port means and an actuating means for moving said movable member relative to the fixed member to vary the size of the flow area of the restricted passage.

3,916,847
INTAKE AND EXHAUST SYSTEM FOR THREE VALVE INTERNAL COMBUSTION ENGINE

Soichi Nakano, Kawagoe; Eiji Taguchi, Tokyo, and Yoshitoku Iizuka, Toda, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

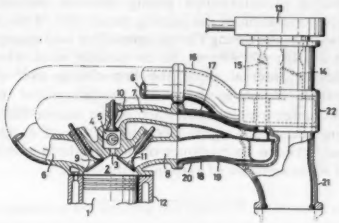
Filed June 27, 1973, Ser. No. 374,082

Claims priority, application Japan, June 28, 1972, 47-64667

Int. Cl. F02b *19/10, 19/18*

U.S. Cl. 123—32 SP **5 Claims**

1. In an internal combustion engine having valved intake and exhaust passages communicating with a main combustion chamber, and having a valved intake passage communicating with an auxiliary combustion chamber, the chambers communicating through a torch opening, the passages and opening being positioned within a cylinder head of the engine, and a spark plug positioned to ignite a combustible mixture in the auxiliary chamber, the improvement comprising, in combination: means including a first thin wall metallic conduit extending laterally to the cylinder head for supplying a combustible mixture to the valved intake passage to the auxiliary chamber, means including a second thin wall metallic conduit extending



laterally from the cylinder head for receiving exhaust gasses from the valved exhaust passage, and means laterally spaced from the cylinder head connecting at least a portion of said thin wall metallic conduits in heat exchange relationship so that the combustible mixture in said first conduit is heated by exhaust gasses in said second conduit, and means including a protective shell of relatively thick walls surrounding and structurally supporting said conduits, and extending for the full lengths thereof.

3,916,848
AUTOMOTIVE-TYPE INTERNAL COMBUSTION ENGINE EXHAUST GAS EMISSION CONTROL SYSTEM

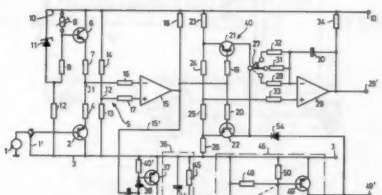
Peter-Jürgen Schmidt, Schwieberdingen, Germany, assignor to Robert Bosch GmbH, Gerlingen-Schillerhohe, Germany

Filed Dec. 13, 1973, Ser. No. 424,464

Claims priority, application Germany, Jan. 12, 1973, 2301354

Int. Cl.[2] F02B *3/00*

U.S. Cl. 123—32 EA **11 Claims**



1. In an internal combustion engine exhaust emission control system having

means (1) sensing the composition of the exhaust gases and providing a sensed electrical signal,

an integrating control amplifier (29, 30) connected to said sensing means (1) and providing an output signal (29') which is available to command the relative mass ratio (λ) of air-fuel applied to the engine;

and a threshold switch (15), connecting the sensing means (1) to the integrating control amplifier and operative to change switching state above, and below its threshold level, said threshold switch, upon normal operation of the system, cyclically switching between its states.

a timing circuit (36) connected to the threshold switch (15) and measuring the time intervals between change-over of switching state of the threshold switch (15), as determined by changing output from the sensing means (1) the timing circuit sensing the intervals between change-over of the threshold switch (15'); and

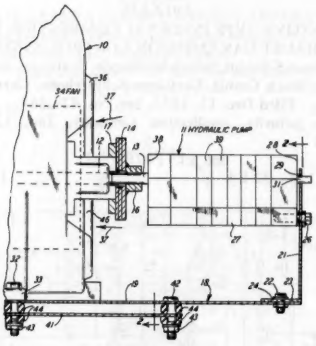
a change-over switch (46; 47, 49) controlled by said timing circuit (36) the timing circuit controlling said change-over switch to be in a first state when the duration of the intervals between change-over of the threshold switch are below a predetermined timing interval, indicative of proper operation of the sensing means and of the threshold switch, the timing circuit controlling said change-over switch (46; 47, 49) to be in another state when the switching interval since the last change-over of the threshold switch is above said predetermined interval, said change-over switch, when in the second state, providing an output signal (49') indicative of excess time lapse between change-over of the threshold switch (15) and representative of system malfunction.

3,916,849

ENGINE AND HYDRAULIC PUMP ASSEMBLY

Sahag C. Akgulian, Racine, and Donald G. Haffner, Glendale, both of Wis., assignors to Jacobsen Manufacturing Company, Racine, Wis.

Filed Sept. 12, 1974, Ser. No. 505,267
Int. Cl.² F01P *1/06*
U.S. Cl. 123—41.31 **5 Claims**



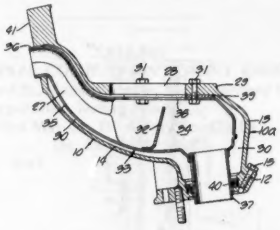
1. An engine and a hydraulic pump assembly for a tractor having a frame, comprising an engine including a crankshaft and a fan disposed on the axis of said crankshaft for moving air over said engine, a hydraulic pump including a driven shaft coupled with said crankshaft and disposed on the axis thereof for driving said pump, a mounting member including fasteners for attaching said engine and said pump to said mounting member, said pump being disposed adjacent said engine and on the side thereof from whence said fan draws the air to move it over said engine to thereby have the air move over said pump before it moves to said engine, said pump being elongated and having its said driven shaft at one end of said pump and adjacent said engine and having said one end supported on said crankshaft, and said mounting member including a bracket connected with the other end of said pump for supporting said other end and positioning said other end furthest from said engine.

3,916,850

INTAKE AND EXHAUST MANIFOLD ASSEMBLY FOR INTERNAL COMBUSTION ENGINE

Tasuku Date, Tokyo; Soichi Nakano, Kawagoe, and Yoshitoku Iizuka, Toda, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 25, 1974, Ser. No. 445,823
Claims priority, application Japan, Mar. 6, 1973, 48-25729
Int. Cl.² F02B *77/12, 19/00*
U.S. Cl. 123—52 M **14 Claims**



1. A manifold system for an internal combustion piston engine of the type having an auxiliary combustion chamber associated with each main combustion chamber and connected thereto by a torch nozzle, the manifold system comprising, in combination: an intake manifold including a main intake chamber and main intake passages extending from said main intake chamber to the engine to deliver a lean air-fuel mixture to each main combustion chamber, said intake manifold also including an auxiliary intake chamber and auxiliary intake passages extending from said auxiliary intake chamber to the engine to deliver a rich air-fuel mixture to each auxiliary combustion chamber, an exhaust manifold comprising a thin wall metal liner enveloped by and spaced within a thick wall outer housing, said liner having pipes for collecting exhaust gases from each main combustion chamber and having an exhaust chamber connected to each said pipe, said exhaust manifold having a lateral opening, and a riser member forming a part of said intake manifold and associated with said opening to transfer heat of the exhaust gases to the intake mixtures in the main intake chamber and the auxiliary intake chamber to insure vaporization of both mixtures, the riser member having a first portion of small area adjacent the auxiliary intake chamber and a second portion of large area adjacent the main intake chamber, said first and second portions of the riser member being integrally formed.

3,916,851

TWO-CYCLE INTERNAL COMBUSTION ENGINE

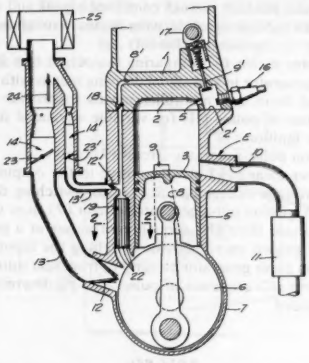
Junji Otani, Omiya, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 29, 1973, Ser. No. 420,227
Claims priority, application Japan, Dec. 8, 1972, 47-122434
Int. Cl.² F02B *33/04*
U.S. Cl. 123—73 A **6 Claims**

1. In a two-cycle internal combustion engine of the type having a main combustion chamber and a crankcase, a main scavenging passage between the crankcase and the main combustion chamber and a main intake passage coupled between the crankcase and a carburetor for supplying fuel-air mixture thereto, the improvement comprising:

an auxiliary combustion chamber, a torch nozzle connecting said auxiliary combustion chamber to said main combustion chamber, a spark plug in communication with said auxiliary combustion chamber, auxiliary carburetor means for producing an auxiliary fuel mixture, and passage means connected to said auxiliary carburetor means and said auxililary combustion chamber for conducting said auxiliary fuel mixture to said auxiliary combustion

chamber, said auxiliary passage means including an auxiliary scavenging passage having one end thereof joining the inlet of said auxiliary combustion chamber, first valve means situated at the inlet to said auxiliary combustion chamber, means coupled to said first valve means for



opening and closing the same, and a pressure receiving chamber, one end of which is in open communication with said crankcase, said auxiliary scavenging passage having its other end connected to the other end of said receiving chamber.

3,916,852

INTAKE MIXTURE HEATING DEVICE FOR INTERNAL COMBUSTION ENGINE

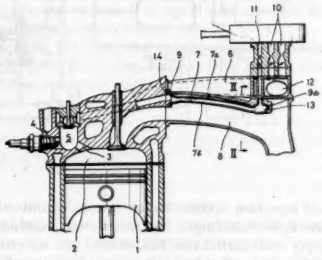
Yoshitoshi Sakurai, Kawasaki, and Satoru Ohata, Oi, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed July 6, 1973, Ser. No. 377,065

Claims priority, application Japan, July 7, 1972, 47-79752[U]

Int. Cl. F02b *17/00*

U.S. Cl. 123—75 B **8 Claims**



1. In an internal combustion engine, the combination of: walls including a piston forming a main combustion chamber, walls forming an auxiliary combustion chamber, means forming a torch nozzle connecting said chambers, spark ignition means associated with the auxiliary chamber, means forming an intake passage for delivering a rich mixture to the auxiliary chamber, means forming an intake passage for delivering a lean mixture to the main chamber, means including a member forming an exhaust passage for conducting exhaust gases from the main chamber, a portion of the auxiliary chamber intake passage comprising a metal pipe enveloped within the exhaust passage and secured relative to the exhaust passage member only at the ends of the metal pipe thereof which extend into the body of said member.

3,916,853

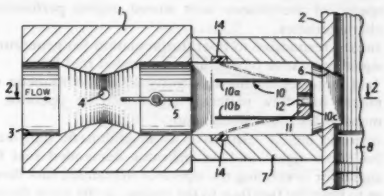
SPEED LIMITING GOVERNOR FOR INTERNAL COMBUSTION ENGINE

Ralph S. Lombard, Stamford, Conn., assignor to Textron Inc., Providence, R.I.

Filed Apr. 18, 1974, Ser. No. 462,178

Int. Cl.² F02D *31/00*

U.S. Cl. 123—97 R **11 Claims**



1. A governor for limiting the speed of an internal combustion engine having means including an intake, passageway for supplying a fuel-air mixture to the engine, said governor comprising a flexible reed mounted in said passageway and having two blades which are movable by flexing of said reed between a normal unflexed condition in which they are approximately parallel to one another and extend approximately lengthwise of said passageway and a flexed condition in which they extend across said passage so as at least partially to block said passageway, said reed having a natural resonant frequency corresponding approximately to the selected maximum speed of said engine, whereby said reed remains in said normal condition when the engine runs at normal operating speed and is induced to vibrate as the engine approaches said selected maximum speed, thereby intermittently at least partially blocking said passageway to reduce the fuel-air mixture supplied to the engine and limit engine speed.

3,916,854

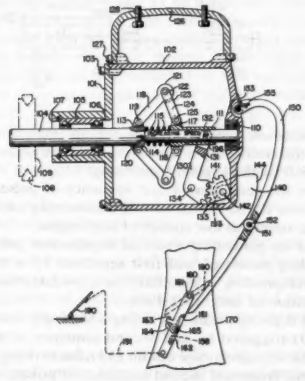
FUEL-FLOW LIMITING APPARATUS

Richard E. Barton, and Margaret M. Barton, both of 187 Kent St., Scituate, Mass. 02066

Filed June 26, 1972, Ser. No. 265,991

Int. Cl.² F02D *9/00, 11/02, 11/10*

U.S. Cl. 123—108 **19 Claims**



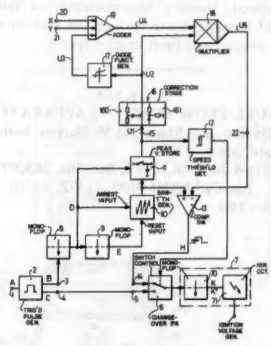
1. A device for limiting the operator-demanded fuel flow to an internal combustion engine to an amount dictated by certain engine performance characteristics comprising in combination:

a. engine speed sensing means for generating a signal which is a function of engine speed;
b. actuator means for receiving the speed sensing signal and itself generating a mechanical position as a function of engine speed;
c. arithmetic unit means, adapted to store engine performance characteristics, for receiving the mechanical position generated by the actuator means and itself generating a fuel flow metering signal as a function of engine speed, in accordance with stored engine performance characteristics;
d. means responsive to operator actuation for generating a signal indicative of operator demanded fuel flow;
e. fuel metering means responsive to said arithmetic unit means fuel flow metering signal and an operator demanded fuel flow signal; and
f. override means responsive to an arithmetic unit means fuel flow signal and an operator demanded fuel flow signal for overriding the operator demanded fuel flow so as to limit the fuel flow to the engine, to the value dictated by the engine performance characteristics.

3,916,855
ELECTRONIC IGNITION TIMING AND TIMING SHIFT CIRCUIT FOR INTERNAL COMBUSTION ENGINES

Edwin Fauser, Sersheim; Günter Schirmer, Ingersheim; Leo Steinke, Hegnach, and Rainer Hellberg, Ludwigsburg, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Jan. 9, 1974, Ser. No. 431,880
Claims priority, application Germany, Jan. 12, 1973, 2301352
Int. Cl.[2] F02P 5/04
U.S. Cl. 123—117 R **8 Claims**

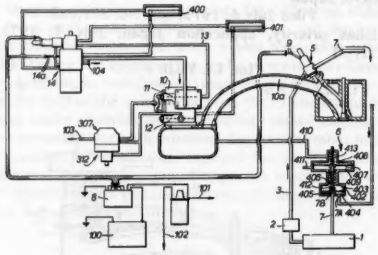


1. Electronic ignition system for an internal combustion engine for control by a transmitting device operated off the crankshaft of the engine, comprising:
means for generating a first sequence of pulses (C) in response to the output of said transmitting device for ignition timing at low speeds of said engine;
means for generating a second sequence of pulses (B) preceding pulses of said first sequence by a time interval corresponding substantially to a predetermined angle of rotation of said crankshaft;
signal deriving means, including a sawtooth wave generator (10) triggered by said second sequence of pulses and a peak voltage storage circuit (11), for deriving at least one signal from said second sequence of pulses;
signal modifying means for the output of said peak voltage storage circuit (11) for providing at least one modified output signal of said signal deriving means, said signal modifying means including time rate of voltage change modifying means (16) to which the output of said peak voltage storage circuit is supplied and function generator means (17);
means for combining by algebraic addition a plurality of signals representative of engine operating parameters and thereby providing a combined signal;
multiplier means for providing a signal representative of the algebraic product of said combined signal and a signal supplied by said signal deriving means through said peak voltage storage circuit thereof;
comparator means for comparing the output of a sawtooth wave generator in said signal deriving means with a signal derived from said multiplier means to provide a third sequence of pulses (H) for variable advanced timing of engine ignition;
an ignition pulse generator circuit (7); and
switchover means (12, 6) responsive to the output of said peak voltage storage circuit (11) for switching the input of said ignition pulse generator circuit (7) from said first (C) to said third (H) sequence of pulses at a predetermined engine speed and for switching the input of said ignition pulse generator circuit (7) from said third (H) to said first (C) sequence of pulses at a predetermined engine speed.

3,916,856
FUEL INJECTION SYSTEMS FOR INTERNAL COMBUSTION ENGINES

Harold Ernest Jackson, Plymouth, England, assignor to Petrol Injection Limited, Plymouth, England

Filed Dec. 26, 1973, Ser. No. 428,411
Claims priority, application United Kingdom, Jan. 4, 1973, 569/73
Int. Cl.[2] F02M 51/00
U.S. Cl. 123—139 AW **4 Claims**

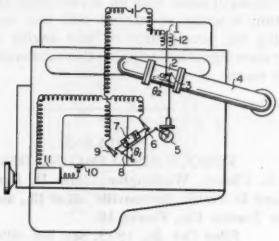


1. A fuel injection system for an internal combustion engine, of the type including a fuel circulation conduit system having supply and return branches, at least one injector device connected to receive fuel from the supply branch, a fuel pressurizing device operable to supply fuel under pressure to the supply branch, and valve means including a valve closure member which is connected in the return branch and is resiliently biased towards a closed position, the valve closure member being exposed to the fuel pressure upstream in the return branch and being movable against the said resilient bias by that fuel pressure to an extent sufficient to maintain that fuel pressure at a predetermined value dependent on the said resilient bias, the system being characterized by means exposed to engine intake manifold vacuum and movable, in response to a drop in manifold vacuum to below a predetermined value, into co-operation with the valve closure member to increase the said resilient bias and thereby increase the said fuel pressure upstream in the return branch.

3,916,857
MEANS FOR CONTROLLING THE EXHAUST RECIRCULATION

Noriho Naito, Kariya; Yutaka Kawashima, Okazaki, and Akira Masuda, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed July 27, 1973, Ser. No. 383,053
Claims priority, application Japan, Aug. 31, 1972, 47-87278
Int. Cl.[2] F02M *25/06*
U.S. Cl. 123—119 A **6 Claims**



1. A device for controlling an exhaust gase recirculation system in an internal combustion engine having a recirculation passage communicating an exhaust side of the engine and a suction side for recirculation of exhaust gases comprising:

a recirculation control valve mounted in said passage for varying the flow rate of recirculating gases,

an acceleration lever having a position which determines engine power,

interlocking means connecting said acceleration lever and control valve so that the flow rate is varied as a function of the lever position including cam means coupled to said lever and valve for decreasing the opening of said valve and the flow rate when said lever is moved toward the maximum power position and increasing the opening of said valve and the flow rate when said lever is moved toward the minimum power position,

means for detection engine speed and producing an actuating signal whenever the detected speed is less than a predetermined value,

means for detecting the rate of movement of said lever and producing an actuating signal whenever the detected rate exceeds a predetermined value,

means for detecting the minimum power position of said lever and producing an actuating signal whenever said minimum power position is detected, and

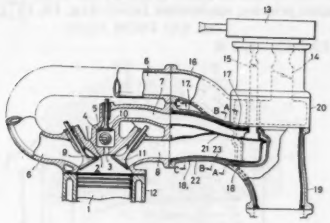
control means connected to each of said detecting and producing means for closing said valve to substantially prevent flow of recirculating gases whenever an actuating signal is produced.

3,916,858
INTAKE AND EXHAUST SYSTEM FOR INTERNAL COMBUSTION ENGINE

Eiji Taguchi, Tokyo; Soichi Nakano, Kawagoe, and Yoshitoku Iizuka, Toda, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 29, 1973, Ser. No. 364,543
Claims priority, application Japan, June 28, 1972, 47-76211
Int. Cl. F02b *19/10, 19/18*
U.S. Cl. 123—122 AB **2 Claims**

1. The combination with an internal combustion engine having a head structure of the type which includes a main combustion chamber and an auxiliary combustion chamber communicating through a torch passage, of an intake and exhaust pipe system comprising: an intake pipe for a rich mixture communicating with the auxiliary chamber, an exhaust pipe communicating with the main chamber, a housing enclosing the intake and exhaust pipes but spaced therefrom, means including a heat transferring partition wall joining said pipes whereby the rich mixture in said intake pipe may be heated by exhaust gases conducted through said exhaust pipe, means attached to the exterior of said housing defining an intake passage communicating with the main chamber, said

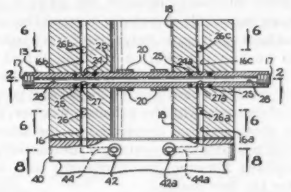


intake passage having a heat exchange surface whereby a lean mixture for the latter said intake passage may be heated by exhaust gases conducted through said exhaust pipe, a carburetor for delivering a lean mixture at right angles to said heat exchange surface, and a carburetor for delivering a rich mixture at right angles to said heat transferring partition wall.

3,916,859
CARBURETOR ANTI-ICE AND OIL COOLING DEVICE

Gust S. Fossum, 42052-3rd St., E., Lancaster, Calif. 93534

Continuation of Ser. No. 308,774, Dec. 15, 1972.
This application Feb. 7, 1975, Ser. No. 548,144
Int. Cl.[2] F02M *31/00*
U.S. Cl. 123—122 AA **4 Claims**



1. An aircraft engine having an oil lubrication system and a carburetor which includes a base defining a carburetor throat, and an apparatus for preventing carburetor icing comprising:

a generally hollow elongated throttle shaft disposed across said carburetor throat and mounted on said carburetor base for rotation about its axis, each end of said shaft including two spaced apart seal grooves, an oil passage groove disposed between said seal grooves, and a plurality of apertures disposed through said shaft within said oil passage groove such that said oil passage groove communicates with the interior of said shaft;

a throttle valve disposed within said carburetor throat, coupled to said throttle shaft;

four o-ring seals, one disposed in each of said seal grooves;

an inlet oil passageway defined by said carburetor base, said inlet passageway terminating in one of said oil passage grooves of said throttle shaft, said inlet passageway for receiving oil from said oil lubrication system of said engine;

an outlet oil passageway defined by said carburetor base extending from the other of said oil passage groove of said throttle shaft for returning oil from said shaft to said oil lubrication system of said engine;

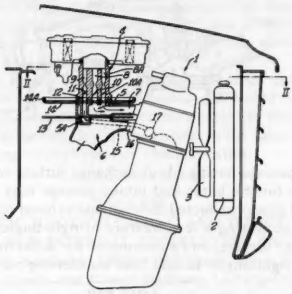
whereby warm oil from said engine may be recirculated in said hollow throttle shaft thereby preventing carburetor icing and also cooling the oil.

3,916,860

CARBURETOR HEAT SHIELD APPARATUS

Soichi Nakano, Kawagoe; Eiji Taguchi, Tokyo; Yoji Ishii, Kawagoe and Yoshitoku Iizuka, Toda, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed July 6, 1973, Ser. No. 377,064
Claims priority, application Japan, Aug. 10, 1972, 47-93817
Int. Cl.[2] F02M *31/00*
U.S. Cl. 123—122 R 12 Claims



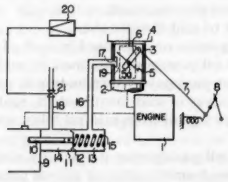
1. In an internal combustion engine having a first intake passage for a lean mixture, a second intake passage for a rich mixture, and a third passage for carrying away exhaust gases following combustion of said mixtures, the improvement comprising, in combination: means forming a heating chamber for the first passage, means forming a heating chamber receiving exhaust gases from the third passage, a first heat shield comprising a plate interposed between the latter said chambers and extending outwardly therefrom, beyond the outer boundaries of said heat chamber to deter heat from passing upwardly about said heating chamber, a multiple throat carburetor having at least one throat connected to the heating chamber for the first passage, means placing the second passage in heat exchange relationship with the exhaust chamber, the carburetor having another throat connected to the second passage and a second heat shield comprising a substantially horizontal plate interposed between the carburetor and the heating chamber for the first passage.

3,916,861

PNEUMATIC GOVERNOR SYSTEM FOR FUEL INJECTION PUMP

Tetsuji Akashi, Oobu; Masataka Nishimura, Toyohashi, and Yoshihiko Tsuzuki, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Japan

Filed Oct. 4, 1973, Ser. No. 403,608
Claims priority, application Japan, Oct. 6, 1972, 47-100880
Int. Cl.[2] F02M *39/00;* F02D *1/04*
U.S. Cl. 123—139 E 5 Claims



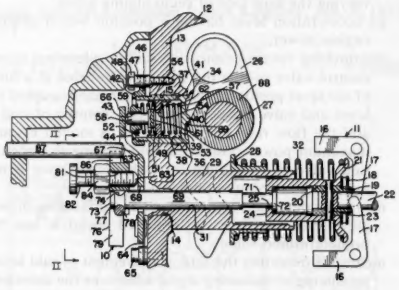
1. A pneumatic governor system for a fuel injection pump having a control rack for controlling the amount of fuel injected into an internal combustion engine and a pneumatic governor operatively connected to said control rack, said pneumatic governor being provided with a deformable member connected to said control rack for defining a vacuum chamber which receives a vacuum produced in an intake manifold of said engine and an atmospheric pressure chamber which receives atmospheric pressure; comprising, an atmospheric pressure intake passage fixed on said atmospheric pressure chamber for introducing atmospheric to the same, throttle means fixed in said atmospheric pressure intake passage for throttling said passage in accordance with an electrical signal, control means connected with said throttle means for producing said electrical signal to actuate said throttle means in accordance with an acceleration signal, and an acceleration detector connected with said control means for detecting the acceleration of said engine to produce said acceleration signal and to apply this acceleration signal to said control means.

3,916,862

TORQUE RISE LIMITING DEVICE

Jerry A. Clouse, Washington; John H. Parks, Peoria, and Millard D. Potter, Bartonville, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 26, 1973, Ser. No. 409,864
Int. Cl.[2] F02D *1/04, 1/06*
U.S. Cl. 123—140 MC 18 Claims



1. A torque rise limiting device, for an internal combustion engine having a speed responsive governor adapted normally to urge a fuel control member toward an increased fuel position when the load on the engine is increased, comprising:

sensor and actuator means operatively associated with such governor and such fuel control member initially permitting the fuel control member to be moved toward an increased fuel position by the governor in response to a decrease in engine speed due to a load imposed thereon; and

reaction means operatively associated with said sensor and actuator means and responsive to a conditional change of the governor transmitted thereto by the sensor and actuator means when the speed of the engine decreases below a predetermined speed due to the load imposed thereon to impart a reaction force through the sensor and actuator means to reverse the direction of movement of the fuel control member and automatically move the fuel control member toward a decreased fuel position so that the volume of fuel directed to the engine is reduced for limiting the natural torque rise thereof and minimizing noxious exhaust emissions therefrom.

3,916,863
ELECTRICAL SIGNAL GENERATING DEVICE FOR USE IN COMBUSTION ENGINES

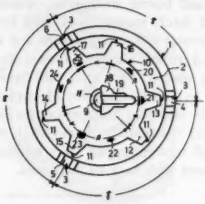
Gerd Höhne, Ludwigsburg; Jörg Issler, Stuttgart; Gerhard Söhner, Geradstetten, and Leo Steinke, Hegnach, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Oct. 5, 1973, Ser. No. 403,877

Claims priority, application Germany, Oct. 21, 1972, 2251834

Int. Cl.² F22B 7/12

U.S. Cl. 123—148 R **6 Claims**



1. In an electrical signal generating device for use in combustion engines having a crankshaft rotated by a plurality of pistons, a combination comprising stator means; rotor means coaxial with said stator means and adapted for connection with said crankshaft of said combustion engine to be rotated by the same in one direction relative to said stator means to at least two angular positions; a first group composed of a first plurality of pole pieces which are equi-angularly spaced about one of said means and project therefrom on radii which extend outwardly from the axis of rotation of said rotor means; and a second group of pole pieces angularly spaced about the other of said means and including at least two sets each composed of a second plurality of pole pieces which is identical with said first plurality so that the total number of said pole pieces of said second group is a whole-number multiple of the total number of said pole pieces of said first group, each of the pole pieces of one of said sets being simultaneously juxtaposed with one each of the pole pieces of said first group and all of the pole pieces of the other of said sets being simultaneously respectively located intermediate successive pole pieces of said first group when said rotor means is in said one angular position, and each of the pole pieces of said other set being simultaneously juxtaposed with one each of the pole pieces of said first group and all of the pole pieces of said one set being simultaneously respectively located intermediate successive pole pieces of said first group when said rotor means is in said other angular position so as to generate a large magnitude electrical signal, the angular distance through which said rotor means travels in said one direction from said one to said other angular position being different from the angular distance through which said rotor means travels in said one direction from said other to said one position, so that said differing angular distances provide for operation of said pistons in a consecutively time sequential manner so as to substantially reduce the stress on said rotating crankshaft.

3,916,864
COMPRESSION-IGNITION ENGINE

Bernhard Horstmann, Neuss, Germany, assignor to International Harvester Company, Chicago, Ill.

Filed June 10, 1974, Ser. No. 477,948

Int. Cl.² F02B 23/00; F02F 3/26

U.S. Cl. 123—191 R **9 Claims**

1. A compression-ignition engine of the type having a cylinder, a piston having two cavities formed in the crown thereof and being reciprocably carried in the cylinder, a cylinder head closing one end of the cylinder and having an air inlet passage means for directing air into the closed end of the cylinder during an induction stroke of the piston, and a fuel injection nozzle means carried on the cylinder head for injecting fuel into the closed end of the cylinder near the end of a compression stroke of the piston, wherein the improvement comprises: the two cavities in the piston crown being cylindrical and forming two deep pan-shaped depressions which are spaced apart equidistantly on opposite sides of the center of the piston crown;

the piston crown having a slot communicating the depressions, the slot having a depth extending substantially to the bottom of the depressions and having two parallel walls each of which extends tangentially from a respective cylindrical surface of each depression; and

the fuel injection nozzle means having a discharge end projecting into the cylinder to a depth that the discharge end extends into one of the depressions in the piston crown at the end of the compression stroke of the piston.

3,916,865
ELECTRONIC GOVERNOR FOR INTERNAL COMBUSTION ENGINE

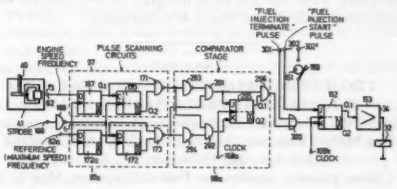
Uwe Kiencke, Moglingen, and Martin Zechnall, Schwieberdingen, both of Germany, assigrors to Robert Bosch GmbH, Gerlingen-Schillerhohe, Germany

Filed June 12, 1974, Ser. No. 478,594

Claims priority, application Germany, July 12, 1973, 2335440

Int. Cl.² F02B 77/00; F02P 9/00

U.S. Cl. 123—198 DB **7 Claims**



1. Governor arrangement for an internal combustion engine, having an electronic control system including a digital circuit providing fuel supply and fuel termination signals to the engine, and means (41) providing a speed signal ($f3$) having a frequency proportional to engine speed, said governor arrangement comprising

means (62a) providing a reference signal frequency proportional to maximum permissible governed engine speed;

comparator means (98a) having said speed signal ($f3$) and said reference signal (f_r) applied thereto and providing an output signal when the frequency of the speed signal exceeds the frequency of the reference signal;

a digital switch (152) connected to control termination of fuel supply to the engine when controlled to change state, the output signal from said comparator means (98a) being connected to the digital switch to cause said switch to change state when said output signal from the comparator means is generated; and

pulse scanning or strobing circuits (97, 97a) connected to said speed signal generating means (41) and said refer-

ence signal generating means (62*a*), respectively, and equalizing the pulse durations of the signals provided by said respective signal generating means.

3,916,866

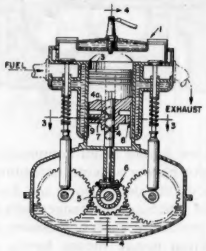
ENGINE HAVING RECIPROCATING PISTON AND ROTARY PISTON

Joseph M. Rossi, 2015 Cedar Ave., Scranton, Pa. 18505

Filed Oct. 11, 1972, Ser. No. 296,547

Int. Cl.[2] F02B *75/32*

U.S. Cl. 123—197 R **5 Claims**



1. In an internal combustion engine of tye type employing reciprocating piston means slidably mounted on the head-end of a piston rod for imparting rotary movement to the piston rod, the improvement comprising, radially extending guide means extending between the piston means and the cylinder for preventing rotation of the piston during its reciprocatory movement on the piston rod, said guide means comprising at least one longitudinally extending key secured to the cylinder wall in proximity to only the bottom end thereof, and a key-way formed on the side wall of said piston means in proximity to only the bottom end thereof for receiving said key to thereby provide a spline connection between the piston means and the cylinder in proximity to only the bottom ends thereof, whereby rotation of the piston relative to the piston rod is prevented while the gas-tight integrity of the cylinder on the combustion side of the piston is maintained.

3,916,867

PROJECTILE PROJECTING TOY GUN HAVING SLIDABLE PIVOTABLE BARREL MEMBER

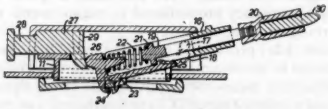
Peter John Marshall, Irthlingborough, England, assignor to The Mettoy Company Limited, Northampton, England

Filed Apr. 26, 1974, Ser. No. 464,466

Claims priority, application United Kingdom, May 1, 1973, 20660/73

Int. Cl. F41b *7/00*

U.S. Cl. 124—16 **2 Claims**



1. A toy projectile firing gun comprising:

a turret housing rotatable about a first vertical axis;

a gun assembly rotatably mounted in said housing for limited pivotal movement about a second, horizontal elevational axis, said gun assembly comprising a breech block section, a barrel section mounted for axial movement in said breech block section, said barrel section having a projectile receiving portion, spring means urging said barrel section outwardly of said breech block section and latch means for latching said barrel section in cocked position, against the action of said spring means, inwardly of said breech block section;

and a trigger mounted on said housing independently of said gun assembly and projecting through said housing for manual operation from the exterior of said housing, said trigger being adapted to co-operate with said latch means for releasing the same throughout the range of elevational movement of said gun assembly about said elevational axis,

said breech block section having a tubular forward portion in which a stem portion of said barrel section is slidably guided, said barrel section co-operating at its rear end with said latch means, and said breech block section having pivotal mounting means for mounting said latch means and trunnion means, forwardly of said pivotal latch mounting means, by which said breech block section is mounted in said housing for movement about said elevational axis, and said housing comprising means mounting said trigger rearwardly of said latch means for rectilinear reciprocal movement in said housing for co-operating engagement with said latch means.

3,916,868

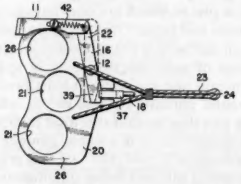
BOWSTRING RELEASING DEVICE

William P. Wolfe, Parkersburgh, W. Va., assignor to The Raymond Lee Organization, New York, N.Y., a part interest

Filed Feb. 19, 1974, Ser. No. 443,456

Int. Cl.[2] F41C *19/00*

U.S. Cl. 124—35 A **4 Claims**



1. An archery device for engaging and drawing a bow string of an archery bow and for effectuating a triggered release of a drawn bow string comprising,

a bracket of semi-rigid material contoured so as to be grasped by a hand of a user, said bracket incorporating, a flexible cord, one end of which is fastened to the bracket, with the cord terminating in a loop at its free end,

a release wheel rotatably mounted on said bracket, said release wheel fitted with a first means on the periphery thereof to latch the loop of the flexible cord in a first position on the release wheel, said means freeing the loop of the flexible cord in a second position of the release wheel when the flexible cord is under tension caused by wrapping the flexible cord about a drawn and taut bow string and said means is free to rotate, and

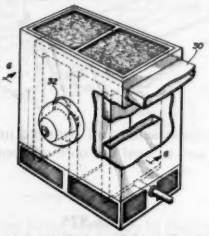
a trigger mechanism which comprises a lever rotatably mounted to the bracket, which lever engages, in the latched position of the trigger mechanism, a second means on the periphery of the release wheel in the said first position of the release wheel so as to prevent rotation of the release wheel, said rotatable lever also rotatably engaged to a trigger bar which is slidably mounted on said bracket, with spring bias means fastened to the assembly of the lever and the trigger bar to maintain the lever in engagement with the release wheel, such that manual actuated sliding motion of the trigger bar serves to rotate the lever free of engagement with the release wheel, permitting the release wheel to freely rotate from the said second position under the torque of the tension of the flexible cord that is latched to the release wheel, and so

that the flexible cord and a taut bow string is freed of engagement with the release wheel.

3,916,869
HEAT EXCHANGE APPARATUS

Raymond J. Dufour, Wheaton, Ill., assignor to Institute of Gas Technology, Chicago, Ill.

Filed Feb. 15, 1974, Ser. No. 442,794
Int. Cl.² F24H *3/02*
U.S. Cl. 126—110 R **7 Claims**

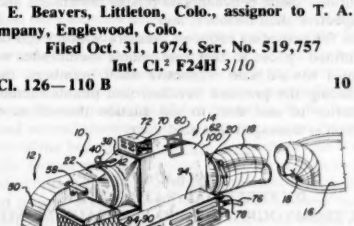


1. Apparatus comprising at least one catalytic combustion cell formed of a pair of closely spaced parallel plates having the facing surfaces thereof coated with a catalyst selected from the class consisting of a noble metal catalyst and a non-precious metal oxide catalyst for combusting a fuel discharged between said plates, orifice means positioned below said plates for discharging fuel supplied thereto between said plates, and a housing about said plates having combustion air inlets therein to permit a flow of air into said housing to mix with fuel discharged from said orifice to initiate flameless combustion as the fuel-air mixture passes in contact with said catalyst and over the outer surfaces of said plates to remove heat from them as it is generated by catalytic combustion, said catalyst thereby being kept below the flame ignition temperature of the fuel-air mixture and heat transfer between said plates and the air flowing over the outer surfaces of said plates occurring so as to heat said air, whereby flameless catalytic combustion occurs directly on one side of a heat exchange surface that is cooled on the opposite side by the fluid to which heat is being transferred so as to prevent flame ignition due to overheating of the catalyst and at the same time provide efficient heat transfer.

3,916,870
HEATER-BLOWER ASSEMBLY

Allan E. Beavers, Littleton, Colo., assignor to T. A. Pelsue Company, Englewood, Colo.

Filed Oct. 31, 1974, Ser. No. 519,757
Int. Cl.² F24H *3/10*
U.S. Cl. 126—110 B **10 Claims**

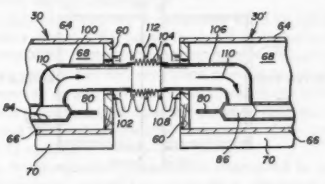


1. A portable heater-blower assembly comprising in combination: a blower subassembly including an electric-motor driven forced air fan, a blower housing enclosing said fan having an outlet connectable to an air duct, and an electrical outlet within said housing alongside said air outlet facing in the same direction as the latter; a heater subassembly including at least one gas-fired burner connectable to a source of gaseous fuel, electric ignition means positioned adjacent said burner operative upon actuation to ignite same, first electrically-actuated valve means connected to control the supply of fuel to said burner; a heater housing including a plenum having an air inlet detachably connectable to the forced air outlet of the blower subassembly, a heat exchanger within said plenum positioned to receive the hot gaseous products of combustion from the burner and pass same in heat-exchange relation to the air from the blower subassembly, an electrical circuit including the electric ignition means and first electrically-actuated valve means having a plug detachably connectable to the electrical outlet of the blower subassembly, and means carried by said heater housing in opposed relation to the electrical outlet in said blower housing cooperating therewith to maintain said plug operatively connected thereto when the heater plenum inlet is connected to receive air from the forced air outlet of the blower subassembly.

3,916,871
FLAT PLATE SOLAR COLLECTOR MODULE

James M. Estes, 3533 Westfield, Fort Worth, Tex. 76133; Eliot E. Kerlin, 2310 Primrose, Fort Worth, Tex. 75040, and Harold A. Blum, 3501 Milton, Dallas, Tex. 75205

Filed June 26, 1973, Ser. No. 373,795
Int. Cl. F24j *3/02*
U.S. Cl. 126—271 **6 Claims**



1. A collector assembly comprising:
a pair of adjacent solar collectors, each of said collectors having a housing defining a sealed evacuated chamber, at least a portion of said housing being constructed to transmit radiant energy into said chamber;
an absorber mounted in each of said chambers to receive said radiant energy entering said chamber;
flow conduits extending through each of said chambers in heat conduction contact with said absorbers for transferring heat from said absorbers to a heat exchange fluid flowing through said conduits, said housings having enlarged ports therein;
a first interconnecting conduit means interconnecting and extending between the flow conduits of said adjacent collectors, said first means extending through said enlarged ports in said housings; and
a second interconnecting conduit means sealed around the exterior of said ports and surrounding said first means.

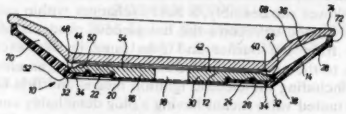
3,916,872
HEAT STORAGE DISH

Egon Kreis, and Niklaus Kehl, both of St. Gall, Switzerland, assignors to Kreis AG, St. Gall, Switzerland

Filed Apr. 5, 1974, Ser. No. 458,348
Int. Cl.² F24H *7/00*
U.S. Cl. 126—375 **11 Claims**

1. A heat storage dish comprising a central heat storage plate, means defining an insulation member surrounding said heat storage plate, means effective during stacking of a plurality of said heat storage dishes for establishing heat transfer relationship between the heat storage plates of adjacently stacked heat storage dishes, said effective means essentially

provides heat conducting contact between the heat storage plates of adjacently stacked heat storage dishes, said insulation member including downwardly sloping inner wall means extending towards the heat storage plate surrounded by said insulation member, said heat storage plate possessing an upper



surface at least part of which protrudes upwardly away from the lowermost location of said downwardly sloping inner wall means, said heat storage plate further including a lower surface extending downwardly past said lowermost location of said downwardly sloping inner wall means.

3,916,873

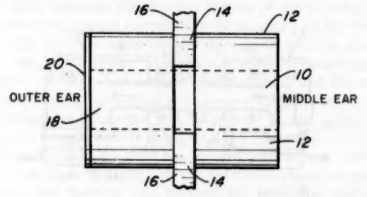
VALVE FOR TYMPANIC MEMBRANE EAR SURGERY

Eric I. Wasserman, 6353 Chaffee St., Ventura, Calif. 93003

Filed Nov. 30, 1973, Ser. No. 420,412

Int. Cl.[2] A61B *19/00; A61F 1/18*

U.S. Cl. 128—1 R **13 Claims**



1. A gas-permeable, chemically inert valve adapted for insertion in the tympanic membrane of the ear comprising:

a. a chemically inert tubular member adapted for lining a passageway through a tympanic membrane having an external surface thereon, said external surface having a portion thereof intermediate the ends of said tubular member about which said tympanic membrane grows, said tubular member having a first opening located at one end thereof and a second opening located at the other end thereof; and

b. chemically inert means covering an entire cross-sectional area of the passageway through said tubular member, said means being impermeable to liquid and solids while being permeable to gases whereby pressure between the middle ear and the outer ear is equalized, while simultaneously preventing any passage of liquids or solids therethrough.

3,916,874

INTRALUMINAL VEIN HOLDER

Richard Perrin, 45 Coulson Ave., Toronto, Ontario, Canada

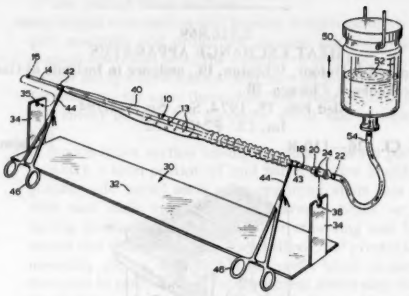
Filed Mar. 11, 1974, Ser. No. 449,726

Int. Cl.[2] A61B *19/00*

U.S. Cl. 128—1 R **7 Claims**

1. A device for use in the preparation of a severed length of vein for arterial grafting, comprising:

an elongated core having a tubular wall closed at one end to define a chamber and open at the other end to define an inlet to the chamber, the wall being perforated in an area intermediate the ends thereof, the outer surface of the wall being smooth, the core being receivable proximally in the vein intraluminally whereby the vein extends along the core in each direction beyond the perforated area of the wall; and



frame means constructed and arranged to receive the core removably and to hold the core adjacent the ends of the wall.

3,916,875

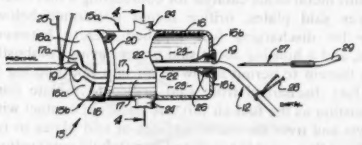
LYMPH DUCT CANNULATION FACILITATOR

Herbert Toch, 15847 E. Arbella Drive, Whittier, Calif. 90603

Filed Jan. 2, 1974, Ser. No. 429,747

Int. Cl.[2] A61B *6/00*

U.S. Cl. 128—2 A **4 Claims**



1. A device for facilitating cannulation of a lymph duct of a living being, comprising;

a rigid exterior shell configured to surround an elongate portion of said lymph duct, said shell being closed at each end except for orifices adapt to accommodate said duct, said shell consisting of two complementary shell members adapted to be clamped about said lymph duct to form a chamber within said shell and to contain said lymph duct portion,

a pair of pliable membranes within said shell, each pliable membrane being peripherally attached to a respective one of said shell members so as to define a respective confined space between said pliable membrane and said respective shell member, and

means for providing reduced pressure within each of said confined spaces so that said pliable membranes will be drawn toward said respective shell members, thereby reducing the pressure between said pliable membranes exterior to said duct to aid dilation thereof as excess lymph is massaged into said duct.

3,916,876

DIFFERENTIAL/RATIOMETRIC ELECTROMYOGRAPHIC BIO-FEEDBACK MONITOR

James Albert Freeman, Kensington, Calif., assignor to FSW Associates, Kensington, Calif.

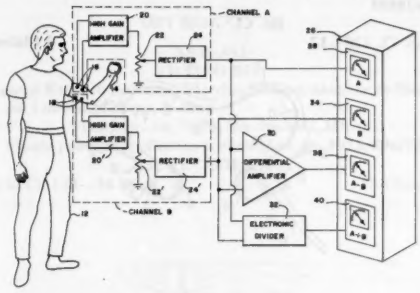
Filed June 13, 1974, Ser. No. 478,915

Int. Cl.[2] A61B *5/05*

U.S. Cl. 128—2.1 M **10 Claims**

1. Apparatus for performing biofeedback physical therapy on a human being, comprising means for measuring the relative tension in a first muscle of the human being, means for measuring simultaneously therewith the relative tension in a second muscle of the same human being, means for indepen-

dently amplifying the tension measurements of the first and second muscles, means for indicating to the human being in real time the instantaneous value of the tension measurements of the first and second muscles so that the human being can

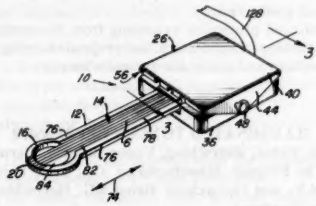


control the muscles being measured in response thereto, said indicating means incuding means for computing an instantaneous ratiometric value from the two tension measurements and means for displaying in real time said ratiometric value to the human being being measured.

3,916,877
TEMPERATURE AND PULSE DETECTOR

Paul Beckman, Huntington Valley, Pa., assignor to United States Surgical Corporation, Baltimore, Md.

Filed Oct. 25, 1973, Ser. No. 409,382
Int. Cl.[2] A61B *5/02, 5/04;* **G01K** *7/12*
U.S. Cl. 128—2.05 R **26 Claims**



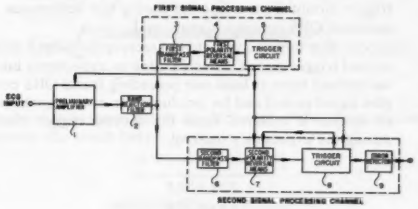
1. An apparatus for simultaneously sensing body temperature and the electrical activity of the heart comprising an oral probe, first electrode means mounted on said probe for insertion into the mouth to simultaneously sense body temperature and act as an electrode means for sensing the electrical activity of the heart, second electrode means, means for mounting said second electrode means for contact with the body, said first and second electrode means acting to sense the electrical activity of the heart when said first electrode means is inserted into the mouth and said second electrode means is simultaneously contacted with the body, and electrical means connected to said first electrode means to determine body temperature and to said first and second electrode means to determine electrical activity of the heart.

23. An apparatus for sensing the electrical activity of the heart comprising an oral probe, first electrode means mounted on said probe for insertion into the mouth, means for holding said probe, and second electrode means mounted on the bottom of said probe holding means for being contacted by the thumb, said first and second electrode means acting to sense the electrical activity of the heart when said first electrode means is inserted into the mouth and said second electrode means is simultaneously contacted by the thumb.

3,916,878
CIRCUIT ARRANGEMENT FOR PRODUCING A PULSE SEQUENCE CORRESPONDING TO A FOETAL CARDIAC RHYTHM

Erich Courtin, Sindelfingen, and Stefan Traub, Boblingen, both of Germany, assignors to Hewlett-Packard GmbH, Boblingen, Germany

Filed May 29, 1974, Ser. No. 474,474
Claims priority, application Germany, June 5, 1973, 2328468
Int. Cl.[2] A61B *5/04*
U.S. Cl. 128—2.06 F **3 Claims**



1. Circuitry for deriving a sequence of pulses corresponding to the heart rate of a foetus from a composite ECG signal which may include signals produced by the mother and other sources including electrical power line noise in addition to the desired foetal signals comprising:

means coupled to receive a composite ECG signal having repetitive foetal QRS complex signal component and a maternal QRS complex signal component, each having varying amplitudes and repetition periods for producing a composite output having dynamic amplitude variations within a predetermined dynamic range in response to the maternal QRS complex signal component of the composite ECG signal;

tracking band-rejection filter means connected to receive the composite output for suppressing electrical power line noise in the composite output and producing a noise filtered output in response to the composite output;

a first signal processing channel having

a first band-pass filter connected to receive the noise filtered output of the tracking band-rejection filter means and having a pass range adapted to pass without appreciable attenuation frequencies of the maternal QRS complex signals which are lower in frequency than the frequencies contained in the foetal QRS complex signals and attenuate the amplitude of the foetal QRS complex signals and produce an output having foetal QRS complex signals of smaller amplitude than maternal QRS complex signals,

first polarity-reversal means connected to receive the output of the first band-pass filter for ensuring that dominating components of the maternal QRS complex signals have a predetermined polarity and for producing an output having maternal QRS complex signals of said predetermined polarity, and

a first trigger circuit connected to receive the output of the first polarity-reversal means for producing as an output a sequence of pulses in response to the appearance of the maternal signals;

a second signal processing channel having

a second band-pass filter connected to receive the noise filtered output of the tracking band-rejection filter means and having a pass range adapted to pass without appreciable attenuation frequencies of the foetal QRS complex signals and attenuate frequencies of the maternal QRS complex signals for producing an output having maternal QRS complex signals attenuated in relation to the foetal QRS complex signals,

a second polarity-reversal means connected to receive the output of the second band-pass filter for producing

an output having the dominating component of each foetal QRS complex signal of a predetermined polarity, and

a second trigger circuit connected to receive the output from the second polarity reversal means for producing as an output a sequence of foetal pulses in response to the foetal QRS complex signals;

interlock means coupled to the first trigger circuit and the second trigger circuit for producing interlocking pulses in response to the sequence of pulses produced by the first trigger circuit and for applying said interlocking pulses to the second trigger circuit during the occurrence of maternal QRS complex signals and for preventing the second trigger circuit from triggering during the occurrence of maternal QRS complex signals; and

error detector means connected to receive the output of the second trigger circuit for calculating an expectancy interval derived from at least one preceding foetal QRS complex signal period and for producing an error signal when no output is received from the second trigger circuit during the expectancy interval.

3,916,879

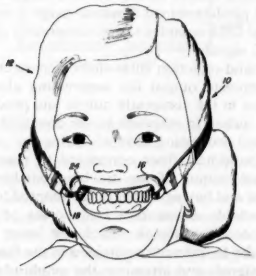
COTTON ROLL HOLDER AND LIP RETRACTOR

Bennett D. Cotten, 606 Baldwin Drive, Albany, Ga. 31705

Filed Mar. 12, 1974, Ser. No. 450,451

Int. Cl.[2] A61B *1/00*

U.S. Cl. 128—12 **2 Claims**



1. A device adapted to be worn on the head of a dental patient, comprising a pair of separate, rigid lip engaging retractors adapted to project into the mouth of the patient between the cheeks and the upper arch and having flat connector portions, lip engaging hook portions and internal extensions projecting from the hook portions into the mouth, a pair of absorbent rolls, holder means mounted on said extensions for retaining the rolls in operative positions between the cheeks and the upper arch, elastic band means connected to the connector portions in encircling relation to the head of the patient for operatively positioning the connector portions externally on the cheeks when the lip engaging hook portions engage the corners of the mouth, each of said hook portions having a two-dimensional curvature extending between the flat connector portion and the extension which projects upwardly at an angle to the flat connector portion between the cheek and upper arch.

3,916,880

DEVICE FOR HOLDING OPEN THE MOUTH

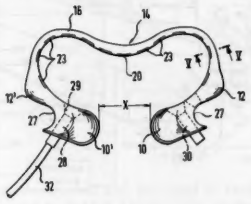
Wolfgang Schroer, An der Weide 19-21, 3 Hannover, Germany

Filed Mar. 21, 1975, Ser. No. 560,646

Claims priority, application Germany, June 14, 1974, 2428855

Int. Cl.[2] A61B *1/00*

U.S. Cl. 128—12 **5 Claims**



1. An improved device adapted for holding open a person's mouth so as to facilitate medical and dental treatments, the improved device comprising:

first and second arc-shaped shells, with each of the arc-shaped shells having a trough-shaped cross-section;

a substantially U-shaped stirrup which includes a central web portion and first and second ends and which extend between and interconnects the first and second arc-shaped shells so that the arc-shaped shells are disposed at a distance from each other, the U-shaped stirrup also including means for elastically biasing the arc-shaped shells apart;

first and second flanges disposed between the first and second ends of the U-shaped stirrup and the first and second arc-shaped shells, respectively, the flanges being shaped so as to bulge sharply outwardly beyond the arc-shaped shells; and

a stud-shaped projection extending from the center of the web portion of the stirrup, the projection being adapted to displace and retain the patient's tongue.

3,916,881

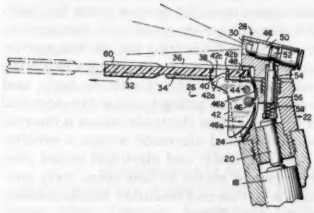
ILLUMINATED TONGUE DEPRESSOR

Helmut A. Heine, Herrsching, Upper Bavaria, Germany, assignor to Propper Manufacturing Co., Inc., Long Island City, N.Y. and Optoechnik Heine KG, Herrsching Upper Bavaria, Germany

Filed Apr. 12, 1974, Ser. No. 460,437

Int. Cl.[2] A61B *1/06*

U.S. Cl. 128—16 **1 Claim**



1. An illuminated tongue depressor comprising an illumination handle, a tongue depressor blade adapted to be inserted in said handle, a blade guide on said handle for receiving said blade, illumination means mounted on said handle above said blade guide for projecting light over the surface of said blade, movable trigger means on said handle including retaining means adapted to securely retain said blade in position, said

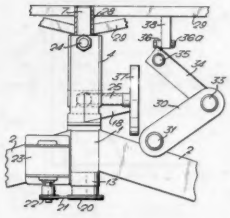
trigger being pivoted at a pivot point on said handle and including a single spring having two legs, one leg bearing against said handle for retaining said trigger in locked position and the other leg projecting into said blade guide in position to bear against said blade for urging said blade outwardly from said blade guide so that depression of said trigger ejects said blade.

3,916,882

TILTING BED

George Kenneth Jameson, Skerries, Ireland, assignor to Medwil Limited, Galway, Ireland

Filed Apr. 16, 1974, Ser. No. 461,358
Claims priority, application Ireland, Apr. 16, 1973, 596/73
Int. Cl.[2] A61H *1/00*
U.S. Cl. 128—24 R **13 Claims**



1. A bed adapted for controlled rhythmic tilting comprising:
a base framework,
an articulated support shaft including an upper shaft member, a lower shaft member and means pivotally connecting the upper and lower shaft members together for rotation as a unit, means rotatably mounting the lower shaft member on the base framework for rotation about a fixed axis,
means connected to the support shaft for rotating the support shaft relative to the base framework,
means for tilting the upper shaft member relative to the lower shaft member,
a mattress support framework supported on the upper shaft member for rotation relative to the support shaft, and
means interconnecting the mattress support framework and the base framework for preventing rotational movement of the mattress support framework relative to the base framework while permitting tilting movement of the mattress support framework relative to the base framework.

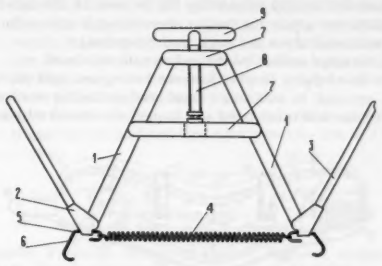
3,916,883

METHOD OF FITTING OF RESILIENT ELEMENTS FOR THE DYNAMIC ALLOSPONDYLEDESIS PURPOSES, AND THE RELEVANT DEVICE TO ENABLE APPLICATION OF THE METHOD

Marian Weiss, Konstancin; Zdzisław Bentkowski, Warslaw, and Sylwester Sokulski, Jeziorna, all of Poland, assignors to Akademia Medyczna, Warsaw, Poland

Filed July 18, 1974, Ser. No. 489,780
Int. Cl.[2] A61F *5/00*
U.S. Cl. 128—69 **2 Claims**

1. Device to enable fitting resilient spring elements used for the dynamic allospondyledesis purposes, comprising in combination structure means with stretcher arms, yoke links catches at the said stretcher arms connected by a pair of thrusting levers and a screw member disposed between said levers



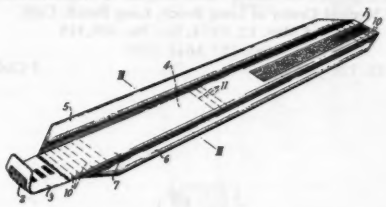
which when rotated causes displacement of the spring means between the catch links.

3,916,884

SUPPORTING COLLAR

David J. Attenburrow, Bridlington, England, assignor to Reed International Limited, London, England

Filed Aug. 27, 1974, Ser. No. 501,103
Claims priority, application United Kingdom, Sept. 25, 1973, 44848/73
Int. Cl.[2] A61H *1/02*
U.S. Cl. 128—75 **7 Claims**



1. A neck supporting collar comprising at least two elongated strips of board material disposed side by side and covered by an envelope of flexible sheet material which provides a longitudinal fold line between the two strips so that the strips can be disposed face to face to reduce the width of the collar, the opposing ends of the collar being provided respectively with cooperating fastening means, at least one of said strips being provided with transverse score lines to control the bending of said collar when said strips are bent about the neck of a wearer to permit the opposing ends of said collar to be fastened to one another by said cooperating fastening means.

3,916,885

ADJUSTABLE CERVICAL COLLAR

John F. Gaylord, Jr., Matthews, N.C., assignor to Medical Specialties, Inc., Charlotte, N.C.

Filed Nov. 14, 1974, Ser. No. 523,890
Int. Cl.[2] A61H *1/02*
U.S. Cl. 128—75 **12 Claims**

1. An adjustable cervical collar for encircling the neck of a wearer and substantially immobilizing the wearer's head while supporting the head and neck, and characterized by the ability to be readily adjusted in height by the wearer while the collar is positioned about the neck, said cervical collar comprising: a pair of substantially parallel, elongate, semi-rigid, flexible bands held in overlapping relationship with one of said bands overlapping the other of said bands when placed in position about a wearer's neck;

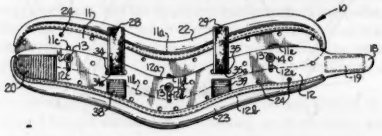
means for releasably securing the cervical collar in encircling relation about the wearer's neck;

means for readily permitting the wearer of the cervical collar to adjust the height thereof while the collar is positioned about the neck, and comprising:

a. an edge surface positioned on said one band,

b. an elongate flexible fastener having one end thereof secured to said other band and extending vertically from said other band and looped about said edge surface such that the other end of said fastener overlies the outer face of said one band, said edge surface serving as a bearing surface whereby a pull exerted upon the fastener results in the overlap of the bands being reduced to thereby increase the height of the collar, and

c. means carried by the outer face of said one band adjacent said edge surface for releasably securing said fastener thereto to permit the fastener to be maintained in a desired position.



3,916,886

PREFORMED SELF-CONFORMING DROP FOOT BRACE

John E. Rogers, La Habra, Calif., assignor to Memorial Hospital Medical Center of Long Beach, Long Beach, Calif.

Filed Mar. 12, 1974, Ser. No. 450,419

Int. Cl.[2] A61F *3/00*

U.S. Cl. 128—80 E 3 Claims

1. An orthopedic foot drop brace defined by a single sheet of a resilient polymerized resin of such shape as to define a first elongate shell of concave-convex transverse cross section that has first and second end portions, said second end portion developing into a second shell of concave-convex cross section that is substantially normally disposed to said first shell, said first and second shells being self conforming and removably positionable adjacent to the posterior calf portion, the heel and instep of a leg of a user who has suffered a stroke or other disability to maintain the foot of said user in a substantially normal walking position relative to said leg, said foot brace being characterized by said first and second shells having a continuous longitudinal central portion of sufficient width and thickness as to prevent any substantial pivoting of said second shell transversely relative to said first shell, said first and second shells on opposite sides of said longitudinal central portion including side portions of lesser thickness than said central portion, each side portion being at least equal in width to said central portion and said side portions possessing sufficient memory to retain said convex-concave cross section, with said side portions of said first and second shells due to the positions thereof relative to said central portion acting as stiffeners that tend to maintain said second shell normally disposed to said first shell, and said first and second shells due to the resiliency of said resin defining the same being self conforming to the exterior surface of the posterior calf portion, heel and instep; and first means for removably securing said first shell in an abutting position relative to the exterior surface of said posterior calf portion of said user.

3,916,887

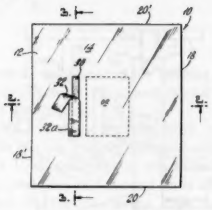
SURGICAL DRAPE WITH ADHESIVE ON TOP AND BOTTOM

Robert E. Kelly, Seabright, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Nov. 11, 1974, Ser. No. 522,560

Int. Cl.[2] A61F *13/00*

U.S. Cl. 128—132 D 18 Claims



1. A surgical drape adapted to be placed on the body of a patient comprising: a main sheet having a top surface and a bottom surface, siad main sheet carrying normally tacky and pressure sensitive adhesive means on a major portion of its bottom surface for securing said main sheet to the body of a patient; normally tacky and pressure sensitive adhesive means carried on the top surface of said main sheet in a limited area, said limited area of adhesive means providing anchoring means for securing operating room articles to said main sheet.

3,916,888

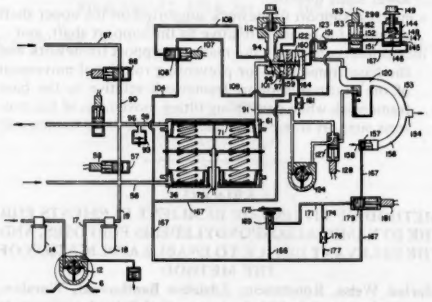
RESPIRATOR

Keith E. Buck, Alamo; Sotiris Kitrilakis, and Thomas C. Robinson, both of Berkeley, all of Calif., assignors to Tecna Corporation, Emeryville, Calif.

Filed Oct. 4, 1973, Ser. No. 403,508

Int. Cl.[2] A61M *16/00*

U.S. Cl. 128—145.6 3 Claims



1. A respirator comprising a displacement chamber having a wall movable toward and away from a predetermined location, means for urging said wall toward said location, means for supplying said chamber with gas at a pressure to urge said wall away from said location, means for detecting the position of said wall relative to said location, means for controlling said supplying means, means responsive to said detecting means

for actuating said controlling means, a patient airway, means for connecting said chamber to said patient airway, a valve in said connecting means, means for operating said valve in accordance with pressure in said patient airway, and means additional to said operating means for urging said valve toward closed position.

3,916,889

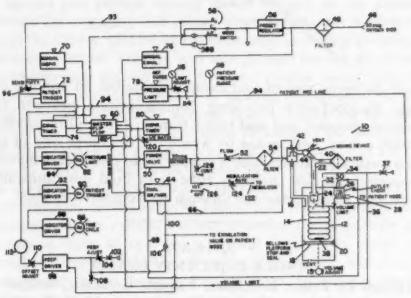
PATIENT VENTILATOR APPARATUS

George K. Russell, Castle Rock, Colo., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed Sept. 28, 1973, Ser. No. 401,739

Int. Cl.[2] A62B *7/04*

U.S. Cl. 128—145.8 **10 Claims**



1. A fluidically controlled patient ventilator apparatus comprising:

a patient breathing hose;

means for supplying a predetermined quantitiy of air to the patient breathing hose;

a fluidic flip flop circuit switchable into first and second states, said flip flop circuit having opposed input ports for controlling said switching, and having at least one output port providing a pressure signal while said flip flop circuit is switched into said first stable state;

means coupled between said flip flop circuit output port and said air supply means to actuate the latter to supply air to the breathing hose in reponse to said pressure signal, thereby defining an inspiratory period of operation;

a first fluidic timing means actuable during said inspiratory period and a second fluidic timing means actuable during an exhalation period, said first and second timing means having respective output ports coupled to said opposed input ports of said flip flop for controlling said flip flop to switch between said stable states, wherein an output signal from said first timing means actuates said flip flop to switch from its first to its second stable state, nd an output from said second timing means actuates said flip flop to switch from its second to its first stable state;

a fluidic trigger circuit having an input coupled to said patient breathing hose for providing a trigger signal at an output port thereof in reponse to a minimum pressure in said patient breathing hose corresponding to the termination of a patient exhalation cycle and means coupling said trigger signal to one of said input ports of said flip flop to control said flip flop to switch from its second to its first stable state to initiate said inspiratory period;

a fluidic pressure limit circuit having an input port coupled to said patient breathing hose for providing a limit signal at an output port thereof in reponse to a predetermined maximum pressure in the patient breathing hose, and means coupling said limit signal to one of said input ports of said flip flop to control said flip flop to switch from its first to its second stable state to terminate said inspiratory period;

a volume limit signal generating means coupled to said patient breathing hose for providing a trigger output signal in response to the sensing of a predetermined quantity of air supplied to the patient breathing hose by the air supply means, and means coupling said trigger signal to one of said input ports of said flip flop to control said flip-flop to switch from its first to its second stable state to terminate said inspiratory period;

and mode selecting means for selectively deenergizing said trigger circuit and said first timing means, one at a time.

3,916,890

AUTOVENT FIELD VENTILATOR

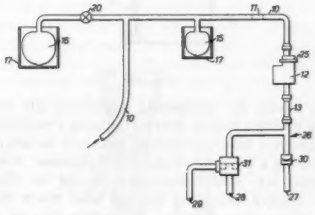
Maurice Frederick Freeman, Oxford, England, assignor to H.G. East & Company Limited, Oxford, England

Filed Nov. 5, 1973, Ser. No. 413,128

Claims priority, application United Kingdom, Nov. 4, 1972, 50916/72

Int. Cl.[2] A61M *16/00*

U.S. Cl. 128—145.8 **4 Claims**



1. An automatic ventilator for automatically supplying inspiration gas to a patient and for automatically permitting exhalation by a patient without any breathing effort by the patient, including:

a gas input line,

first compliant volume means,

transfer conduit means for continuously communicating said first compliant volume means directly with said input line at all times and without interruption during operation of the automatic ventilator,

a first constraint limiting the expansion of said first compliant volume means,

a gas output line,

a pressure responsive valve interconnecting said input line and said first compliant volume means with said output line, said pressure responsive valve being responsive to the gas pressure in the input line to open to pass gas to the output line, and responsive to the gas pressure in the input and output lines, to close,

an inspiration port, and

a one way valve between the output line and said inspiration port to allow gas to flow from the output line to the inspiration port whereby a predetermined volume of gas at a predetermined pressure is periodically delivered automatically to the inspiration port, independent of breathing effort by the patient.

3,916,891
DEVICE FOR MOISTENNING RESPIRATORY AIR FOR COLLECTING THE CONDENSATE

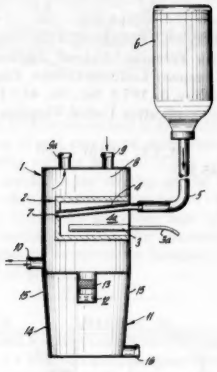
Klaus Freytag, Bad Schwartau, and Manfred Benn, Lubeck, both of Germany, assignors to Drägerwerk Aktiengesellschaft, Germany

Filed June 27, 1974, Ser. No. 483,894

Claims priority, application Germany, July 14, 1973, 2336045

Int. Cl.[2] **A61M** *15/00*

U.S. Cl. 128—192 ** **5 Claims**



1. A device for moistening respiratory air comprising a housing having a hollow interior defining a moisture chamber, an evaporator insert extending into said moisture chamber and defining a separate closed insert chamber, a water supply connected into said housing and having an elongated discharge conduit extending through said insert chamber and into said moisture chamber and terminating in a discharge opening in said moisture chamber for discharging water and vapor therein, means for continuously moving water through said discharge conduit, heater means located in said insert chamber adjacent said portion of said discharge conduit therein for heating said insert chamber and the portion of said discharge conduit therein for vaporizing at least a part of the water passing therethrough, means defining a water collection area at the bottom of said moisture chamber for collecting the surplus water delivered into said housing moisture chamber through said discharge conduit and for also collecting condensate from respiratory air, said means defining a water collection area including an outlet for the water, an inlet in said moisture chamber for delivering respiratory air into said moisture chamber and through the water and vapor discharged by said discharge conduit and over said collection area, and an outlet in said moisture chamber for the respiratory air for returning the heated moistened air to the user for further respiratory use.

3,916,892
PHLEBOTOMY NEEDLE SYSTEM INCORPORATING MEANS TO ADD ANTICOAGULANT AND WASH LIQUID

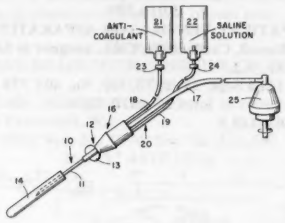
Allen Latham, Jr., Jamaica Plain, Mass., assignor to Haemonetics Corporation, Natick, Mass.

Filed Apr. 29, 1974, Ser. No. 464,835

Int. Cl.[2] **A61M** *01/02*

U.S. Cl. 128—214 R **14 Claims**

1. In a phlebotomy needle system suitable for withdrawing blood from a donor and delivering said blood to a reservoir through a blood transfer tube, including a needle cannula and hub affixed thereto and having tubulation means for introducing an anticoagulant into said blood as it is transferred to said reservoir, the improvement comprising a socket member removably connected through a liquid-tight friction fit with said hub, said socket member comprising a central chamber into which the discharge end of said cannula extends, supporting means within said socket member by which the inlet end of said blood-transfer tube is supported in position to surround



said discharge end of said cannula to define an annular passage therebetween providing communication between said central chamber and said blood transfer tube, a first auxiliary transfer tube, and means by which the discharge end of said first auxiliary transfer tube is supported in said socket member whereby said first auxiliary tube is in fluid communication with said annular passage through said central chamber.

3,916,893
SINGLE-INJECTION DEVICE

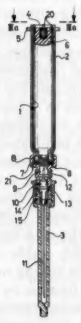
Wilfried De Felice, Kelkheim, Taunus, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Mar. 26, 1974, Ser. No. 455,014

Claims priority, application Germany, Mar. 28, 1973, 2315367

Int. Cl.[2] **A61M** *5/00*

U.S. Cl. 128—218 R **4 Claims**



1. A single-injection syringe, comprising a container for a medicament; said container having first and second open end positions; said first end portion of the container having a penetrable seal mounted therein for sealing said first end portion, and said second end portion having a piston inserted therein to define with said seal a chamber for containing the medicament; a syringe body mounted on and surrounding said first end portion of the container; said syringe body having a penetrable end wall extending across said first end portion of the container and an elongated generally cylindrical sleeve integrally formed with and extending from said wall; said sleeve having an elongated bore formed therein extending from said end wall to an open end located in spaced relation from said end wall and a threaded external periphery; a needle support mounted in said bore for movement between first and

second positions therein; said needle support having a diameter which is slightly less than the diameter of said bore and including an annular projection formed thereon and at least four stabilizing fins extending perpendicularly thereto into engagement with the bore; a needle mounted in said support having an end portion located within said bore in the first position of the needle support and piercing said end wall and said seal as it is moved to its second position; said bore of said sleeve having a pair of spaced annular grooves formed therein respectively defining the first and second positions of said needle, said groove receiving and cooperating with said annular projection on the needle support to hold the needle support in its respective positions against inadvertent movement in the sleeve; and a hollow plunger including a first end portion threadably engaged with said threaded sleeve and operatively engaged in bearing engagement with said support, and a second end portion having means formed on the exterior thereof for engaging said piston when the plunger is removed from the sleeve; said needle support also including an annular shoulder formed thereon; and said plunger having an annular socket formed therein at its first end portion operatively engaging said annular shoulder in bearing engagement to urge said support towards the syringe body to cause the needle to pierce the end wall and seal upon rotation of the plunger on the sleeve when the plunger is rotated on the sleeve in a direction to move it towards the syringe body, said plunger having an elongated chamber formed therein receiving said needle, whereby said needle support forms, with the end wall of said syringe body an enclosed sterile chamber for the needle and is moved from its first to its second position to cause said needle to pierce said end wall and said seal when said plunger is threaded on the sleeve in a direction to move it towards the syringe body.

3,916,894

SYRINGE SEALS AND PISTON

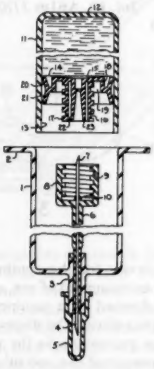
Harold S. Cloyd, Erie, Pa., assignor to Nosco Plastics, Incorporated, Erie, Pa.

Continuation of Ser. No. 290,436, Sept. 20, 1972, abandoned. This application Jan. 24, 1974, Ser. No. 436,113

The portion of the term of this patent subsequent to Oct. 23, 1990, has been disclaimed.

Int. Cl.[2] A61M *5/24, 5/315*

U.S. Cl. 128—220 **13 Claims**



1. A hypodermic syringe structure comprising a barrel open at one end, a plastic stopper piston in said barrel movable in one direction to develop hydraulic pressure expelling fluid from the barrel, said stopper having a plastic body with means for making sealing engagement with said barrel, said body having a tubular portion extending axially in a direction opposite said one direction, said tubular portion having an open end and a plastic diaphragm extending across and closing said tubular portion inward from said open end in position to be punctured, a hub movable relative to the piston, a hypodermic needle fixed in said hub and having one end projecting from said hub and received in said tubular portion and puncturing said diaphragm as said one end of the needle is moved into said open end and having a second end projecting oppositely from said hub for injecting fluid, said stopper including the body, tubular portion and diaphragm being injection molded inert flexible thermoplastic which does not have the self sealing properties of rubber as the needle is forced through the diaphragm to establish communication between the needle and the contents of the barrel, a first axially facing sealing surface on the open end of said tubular portion, a second sealing surface on the hub presented to said first sealing surface, said sealing surfaces surrounding the needle and means clamping said body and hub axially to bring said sealing surfaces together into sealing engagement for stopping leakage around the needle in case the diaphragm does not seal around the needle when it is punctured.

3,916,895

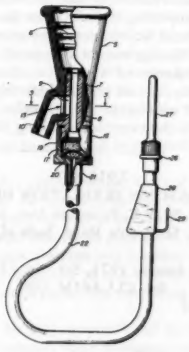
FOUNTAIN SYRINGE

George B. Davis, Jr., 7512 Marbury Rd., Bethesda, Md. 20014

Filed Feb. 28, 1974, Ser. No. 446,960

Int. Cl.[2] A61M *3/00*

U.S. Cl. 128—229 **6 Claims**



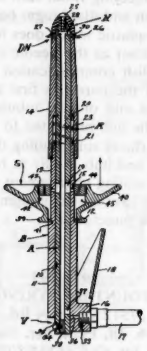
1. In combination with a fountain syringe system of the character disclosed including a syringe nozzle a length of flexible tubing and a flow controlling valve disposed about the tubing for controlling the flow of fluid therethrough an improved one piece connector for connecting said syringe system to a water supply spigot comprising, a resilient body member for extending over and coupling with a water supply spigot, means for connecting in fluid passing relation said connector with the hose of said system to pass water from said spigot to said system, an elongated slit formed within a resilient portion of said connector and stiffening means disposed in predetermined close spaced adjacency about said slit to assist in positioning and maintaining the edges of said slit in abutting and water sealing relation when said resilient body member is extended over said spigot with the edges of said slit being operative to separate and pass water from said connector by way of said slit upon a predetermined increase in pressure within said connector.

3,916,896

PORTABLE DOUCHE AND SITZ BATH

Alexander K. S. Ballard, P.O. Box 24772, Los Angeles, Calif. 90024

Filed Aug. 5, 1974, Ser. No. 494,489
Int. Cl.[2] A61M *3/00*
U.S. Cl. 128—239 20 Claims



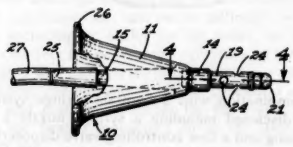
1. An instrument for limited penetration into the anal and vaginal canals and supplied with liquid under pressure for douching, and including; an elongated body with a radially expansible head at its foremost end, the head having a peripheral rim, a stop projecting radially from the body and spaced rearward of the head for restricting penetration of the body into said canals, dilating means to expand the head and rim radially into occupancy of a canal to close the same, and nozzle means comprised of jets immediately rearward of the head and supplied with liquid through valve means for cleansing discharge from the canal surrounding the body.

3,916,897

COLOSTOMY IRRIGATION DEVICE

Austin E. Elmore, 8519 E. Pasadena Ave., and Ernest A. Uhlmann, 4533 N. Scottsdale Road, both of, Scottsdale, Ariz. 85251

Filed June 4, 1971, Ser. No. 150,031
Int. Cl.[2] A61M *3/00*
U.S. Cl. 128—245 9 Claims



1. A colostomy irrigation device comprising in combination: a body having,

a conical outside surface defining a smaller inner end adapted to engage various sized stoma openings in the abdomen of a patient and a large outer end,

an outwardly projecting central coaxially positioned stem formed integral with the small inner end of the conical outer surface of the body and projecting outwardly of the large outer end of said body,

a bore in said stem arranged to receive at the body's smaller inner end in sliding fluid tight arrangement a catheter tube for insertion into a colon of the patient, and

a catheter tube slidably arranged on said stem at the small inner end of said body for receiving liquid.

3,916,898

ADMINISTRATION OF MEDICAMENTS AND THE LIKE

Terrence J. Robinson, Mosman, New South Wales, Australia, assignor to G. D. Searle & Co., Chicago, Ill.

Continuation-in-part of Ser. No. 649,482, June 28, 1967, abandoned, which is a continuation-in-part of Ser. No. 456,527, May 17, 1965, abandoned. This application July 10, 1970, Ser. No. 53,830
Claims priority, application Australia, May 20, 1964, 44703/64; June 30, 1966, 7718/66
Int. Cl.[2] A61M *31/00*
U.S. Cl. 128—260 20 Claims

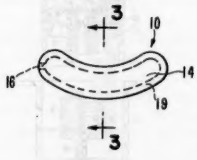
1. The method of controlling fertility of domestic farm animals, which comprises the administration of a removable sponge impregnated with a progestational steroid, permitting the sponge to remain in the animal to continuously release the steroid and inhibit ovulation, followed by removal of the sponge prior to the time insemination of the animal is to occur.

3,916,899

OSMOTIC DISPENSING DEVICE WITH MAXIMUM AND MINIMUM SIZES FOR THE PASSAGEWAY

Felix Theeuwes, Los Altos, Calif., and Takeru Higuchi, Lawrence, Kans., assignors to Alza Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. Nos. 354,325, April 25, 1973, abandoned, and Ser. No. 259,469, June 5, 1972, Pat. No. 3,845,770. This application Feb. 7, 1974, Ser. No. 440,281
The portion of the term of this patent subsequent to Nov. 5, 1974, has been disclaimed.
Int. Cl. A61m *31/00*
U.S. Cl. 128—260 36 Claims



1. An osmotic device for the continuous dispensing of an active agent to an environment of use, said device comprising:

a. a shaped wall formed of a semipermeable material that maintains its integrity during the dispensing period and which is characterized as permeable to the passage of an external fluid in the environment of use and substantially impermeable to the passage of the active agent, the wall surrounding and forming;

b. a compartment containing the active agent that is soluble in the external fluid, and which agent exhibits an osmotic pressure gradient across the wall against the external fluid;

c. a passageway in the wall for dispensing agent from the device, said passageway having a maximum cross-sec-

tional area, A_a, defined as

$$\frac{L}{F} \times \frac{Q_a}{l} \times \frac{1}{DS},$$

wherein L is the length of the passageway, Q_a/l is the mass of agent dispensed from the device per unit time, D is the diffusion coefficient of agent in the dispensed solution, S is the solubility of agent in the fluid and F has a value of from 2 to 1000, said passageway having a minimum area, A_a, defined by

$$\left[\frac{Lv}{l} \times 8 \times \frac{\pi\eta}{\Delta P}\right]^{1/2}$$

wherein L is the length of the passageway, (v/t) is the volume of agent solution dispensed per unit time, π is 3.14, η is the viscosity of the solution being dispensed and ΔP is the hydrostatic pressure difference between the inside and the outside of the compartment and having a value of up to about 20 atmospheres, and;

d. wherein in operation with the device in the environment of use, external fluid from the environment is continuously imbibed through the wall into the compartment in a tendency towards osmotic equilibrium at a rate determined by the permeability of the wall and the osmotic pressure gradient across the wall, thereby continuously dissolving the agent which is dispensed from the device through the passageway at a controlled rate over a prolonged period of time.

3,916,900

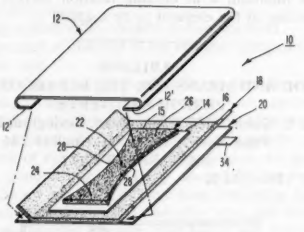
MULTILAYER ONE-PIECE DISPOSABLE DIAPERS

Walter Herman Breyer, Wallingford; Nathan Allen Edelson, Bala Cynwyd, both of Pa.; Barbara Faye Gilliland, Blackwood, N.J., and Clarence Henry Schatz, West Chester, Pa., assignors to Scott Paper Company, Philadelphia, Pa.

Filed Oct. 31, 1974, Ser. No. 519,415

Int. Cl.[2] A41B *13/02*; **A61F** *13/16*

U.S. Cl. 128—287 **43 Claims**



1. A multilayer, one-piece, disposable diaper including:

A. a moisture-pervious facing layer adapted to be positioned in engagement with a wearer;

B. an absorbent core containing hydrophilic fibers disposed beneath said facing layer for absorbing and retaining body fluids which pass through said facing layer;

C. an elastomeric, wet-stable foam layer beneath said absorbent core for confining and maintaining the absorbent core in the perineal region of the wearer, said foam layer having sufficient longitudinal and transverse dimensions for providing elasticity in regions of the diaper that are disposed about the thighs and front and back of the wearer;

D. a moisture-impervious backing sheet beneath said foam layer; and

E. bonding means for retaining the components of the disposable diaper in an assembled, one-piece construction.

3,916,901

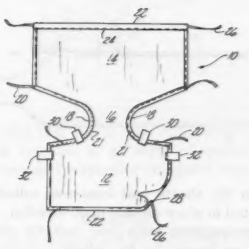
ADULT UNDERGARMENT

Dorothy Korgemets, 9333 E. Jefferson, Detroit, Mich. 48214

Filed Sept. 25, 1973, Ser. No. 400,550

Int. Cl.[2] A61F *13/16*

U.S. Cl. 128—287 **5 Claims**



1. An adult undergarment comprising a cloth material having a back panel and a front panel connected by a narrow central panel defined by opposed inwardly curved sides constituting crotch portions and convergent end sections disposed along the lower edges of said panels and constituting pant leg portions;

channels extending along the length of the crotch portions, the convergent end sections and along the width of said front and back panels at the outer edges thereof, the channels of the leg portions and the outer edge of the front panel opening to the outside surface of said front panel at locations which are inwardly spaced from the side edges of said front panel, the channels of the leg portions and of the outer edges of the rear panel opening to the side edges of said rear panel, said entire front panel from side edge to side edge being smaller than said back panel;

tie cords movably carried within each of said channels, the ends of said tie cords existing from said openings, whereby portions of said back panel overlap portions of said front panel when said garment is worn and the ends of said tie cords are fastened together;

a support band attached to the mid-section of the upper edge of said back panel and extending across said crotch section; and

means carried by said support band for releasable attachment of said support band to the mid-section of said front panel at the upper edge thereof, said releasable attaching means permitting the lengthwise adjustment of said band, said band being adapted to support a moisture absorbing dressing thereon.

3,916,902

MALE INCONTINENCE DEVICE

George T. Lineberger, 178 Reservoir Ave., Providence, R.I. 02907

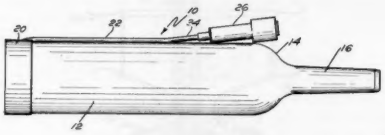
Filed Oct. 15, 1973, Ser. No. 406,687

Int. Cl.[2] A61F *5/44*

U.S. Cl. 128—295 **2 Claims**

1. An incontinence device for a male patient, comprising an elongated, flexible, tubular sheath that includes a relatively thin walled upper portion that is adapted to be rolled and that is adapted to be received over the male member of said patient, the lowermost end of said sheath terminating in a reduced relatively thicker outlet portion to which a drainage receptacle is adapted to be interconnected, a tubular cuff joined to the uppermost end of said tubular sheath and defining a chamber that is inflatable when the sheath is mountable

on said male member, wherein said cuff firmly engages the base portion of said male member for securely mounting said sheath on said male member, an elongated lumen extending longitudinally of said sheath and being integrally molded as a part thereof for a major portion of the length of the thin walled portion of said sheath, so that a wall of said lumen defines a portion of a wall of said sheath, the portion of said lumen that is formed as an integral part of said sheath being rollable therewith prior to mounting of the sheath on the male member, wherein the sheath and lumen as rolled therewith are easily mounted in place on said male member, one end of said lumen communicating with said cuff for directing a fluid under pressure thereto for the inflation thereof, valve means being adapted to communicate with an external source of said fluid under pressure and with the other end of said lumen, wherein fluid received by said valve means from said source is directed to said lumen and into said cuff for the inflation thereof.

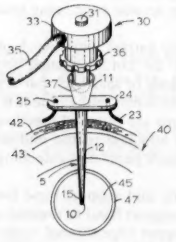


3,916,903

CRICOTHYROID PUNCTURE APPARATUS

Reta M. H. Pozzi, 2486-A E. Manoa Road, Honolulu, Hawaii 96822

Filed July 20, 1973, Ser. No. 381,261
Int. Cl.[2] A61B *17/32, 17/34;* **A61M** *16/00*
U.S. Cl. 128—305.3 **5 Claims**



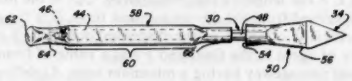
1. Emergency tracheotomy apparatus comprising a single, short, straight, thin, form-retaining cannula having a lumen extending from one end to the other and having an axial opening in a distal end and having opposite lateral openings near the distal end for flowing a gas from the lumen into a trachea, and having an outwardly expanded funnel-shaped receiver at a proximal end for receiving a gas outlet device, the receiver having outwardly sloped inner walls which extend from a minimum dimension near straight walls of the lumen to a maximum dimension at the proximal end of the receiver, and the receiver being formed integrally with the cannula on an extended axis of the lumen, a rigid flange integrally formed with the cannula and receiver on the proximal end of the cannula extending oppositely outward from a junction of the cannula and receiver for preventing excess insertion of the cannula into the trachea and having tie receiving openings in remote areas of the flange for receiving neck encircling ties to hold the flange against the neck of a patient.

3,916,904

TAG INSERTING TOOL

Eugene B. Ritchey, Rte. 3, Box 58, Brighton, Colo. 80601

Filed Apr. 1, 1974, Ser. No. 456,534
Int. Cl.[2] A61B *17/00;* **G09F** *3/00*
U.S. Cl. 128—330 **7 Claims**



1. A tag inserting tool for use in combination with a tag of generally flat resilient material formed with a laterally extensive marking panel, a narrow neck connected at its aft end to the forward end of the panel, and an anchoring head connected at its aft end to the forward end of the neck and provided with a narrow leading end and rearwardly diverging wings defining detent shoulders at the forward end of the neck, the tool comprising:

a slender elongate shank having an enlarged flat piercing head at the forward end and having an aft end, and a first sleeve having a forward flattened end and an aft end and being substantially larger than the shank and surrounding the latter in overlapping condition to form a generally annular chamber between the shank and the inner wall of the sleeve;

the forward ends of the sleeve and shank being permanently connected and the enlarged head of said shank being provided with a piercing point to pierce the element to be tagged, and the aft end of the sleeve terminating intermediate the length of the shank and opening rearward to define the chamber as an elongate pocket around the shank to receive at least the foremost portion of the leading end of the anchoring head folded about the shank;

and a second sleeve slidably mounted on the rearward portion of the shank and having a forward end of lesser diameter than the aft end of the first sleeve to enable it to slide thereinto in overlapping relation; and

the forward end of the second sleeve being axially movable to engage within the folded midportion of the leading end of the anchoring head, force it forward into the pocket, and maintain it in binding relation therein during the piercing of the element to be tagged.

3,916,905

METHOD AND MEANS FOR THE REPAIR OF SEVERED PERIPHERAL NERVES

William E. Kuhn, 2085 Fallon Road, Lexington, Ky. 40504

Filed Nov. 9, 1973, Ser. No. 414,246
Int. Cl.[2] A61B *17/11*
U.S. Cl. 128—334 R **11 Claims**

1. A method of repairing a nerve severed to form first and second nerve ends, said method consisting of the steps of providing a protective, thin walled tube having an inside diameter to just nicely receive said severed nerve ends, said tube having interconnecting porosity to permit adequate diffusion and flow of intraneural and extraneural fluids through the wall of said tube, the pores of said tube being sufficiently fine to prevent infiltration and plugging thereof by extraneural and epineural tissue, said tube being constituted of a material which is compatible with the biological environment of said nerve, said tube having an evacuation hole intermediate its ends, applying suction directly to said hole, approaching one end of said tube to said first end of said severed nerve and

drawing said first nerve end into said one end of said tube by means of said suction, approaching the other end of said tube to said second nerve end and drawing said second nerve end into said other end of said tube and into approximation with said first nerve end by means of said suction.

5. A tube for use in sutureless repair of a nerve severed to form first and second nerve ends, said tube comprising a cylindrical wall and open ends, said tube having an internal diameter sized to just nicely receive said nerve ends, said wall having a transverse evacuation perforation therethrough whereby suction may be applied to said hole to create a pressure differential between the interior of said tube and the ambient atmosphere enabling said first and second nerve ends to be drawn into the ends of said tube to a position of approximation within said tube, said cylindrical wall of said tube having interconnecting porosity to permit adequate diffusion and flow of intraneural and extraneural fluids through said cylindrical wall, the pores of said wall being sufficiently fine to prevent infiltration and plugging thereof by extraneural and epineural tissue, the external diameter of said tube comprising the maximum transverse dimension thereof.

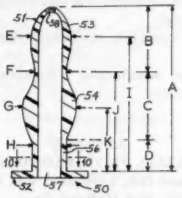
3,916,906
MULTIHEAD DILATOR

Martin E. Gerry, 13452 Winthrope St., Santa Ana, Calif. 92705

Continuation-in-part of Ser. No. 377,820, July 9, 1973, abandoned. This application Apr. 25, 1974, Ser. No. 463,876

Int. Cl.[2] A61M *29/02*

U.S. Cl. 128—344 **5 Claims**



1. A multihead dilator, for dilating a rectal portion, comprising in combination:

a generally cylindrically shaped hollow member;

a flange located at one end of the member integral with said member; and

a plurality of tapered heads of different diameters integral with and located at intervals along the outer periphery of the member, the head with the smallest diameter being located at another end of the member opposite said one end, each of the heads being circumjacent the perimeter of said generally cylindrically shaped hollow member, said member having a central bore extending from the flange to substantially said another end and being narrowed in diameter between said heads and between the head having the largest diameter and the flange, portions of said member having the narrowed diameters between the heads are of foldable material.

3,916,907
SPREADER INSTRUMENT FOR USE IN PERFORMING A SPINAL FUSION

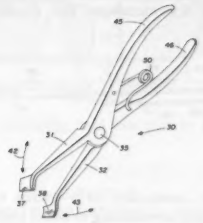
Wendell C. Peterson, 7107 Prospect Place, NE., Albuquerque, N. Mex. 87110

Filed June 21, 1974, Ser. No. 481,637

Int. Cl.[2] A61M *24/00*

U.S. Cl. 128—345 **9 Claims**

1. A spreader for separating vertebral bodies having a hole pre-formed therein to receive a cylindrical plug comprising, two pivotally attached elongated members, and two frustroconically shaped curved plates, each rigidly attached to a respective one of said members, each of said plates having a first outside radius to engage the wall of said hole, and having a second inside radius smaller than said first radius for passing



the bone plug, said first and second radii being upon a common center line oriented at an angle of approximately 30° from an axis along said respective elongated member.

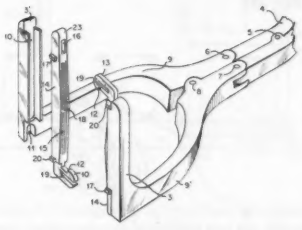
3,916,908
DISPOSABLE BOWEL CLAMP AND DETACHABLE APPLICATOR

Harry H. Leveen, 800 Poly Place, Brooklyn, N.Y. 11209

Filed June 18, 1973, Ser. No. 370,955

Int. Cl.[2] A61B *17/08;* **A44B** *21/00*

U.S. Cl. 128—346 **4 Claims**



1. In combination a compressive applicator means have two opposed and aligned in parallel jaws, each jaw of the applicator having releasably attached to its inner surface one half of an also opposed and aligned interlatching bowel clamp, said bowel clamp comprising a set of rod like members, each of the rod like members frictionally fitted into a receiving channel positioned in the interior surface of each jaw and having on one end thereof a latching finger and on the opposite end thereof a receptacle for the reception of the latching finger, said bowel clamp members being capable of being positioned around the periphery of a bowel and brought into register by the closure of the opposed jaws of the applicator.

3,916,909
SUCTION SURGICAL INSTRUMENT OF THE FORCEPS TYPE

Harold D. Kletschka, Montgomery, Ala., and Edson H. Rafferty, Excelcisor, Minn., assignors to Bio-Medicus, Inc., Minneapolis, Minn.

Continuation of Ser. No. 384,461, Aug. 1, 1973, abandoned, which is a continuation of Ser. No. 198,900, Nov. 15, 1971, abandoned. This application June 24, 1974, Ser. No. 482,622

Int. Cl.[2] A61B *17/30;* **A61M** *1/00*

U.S. Cl. 128—354 **15 Claims**

1. Surgical forceps of a tweezer-like configuration, comprising:

a. first and second elongated movable leg members of essentially the same length and having functional ends defining opposed inner faces and distal outer faces, the leg members being commonly affixed and projecting from the

fixed point in cantilever fashion with the functional ends normally biased apart and cooperable to perform a forceps function;

b. and fluid conduit means associated with one of said first and second leg members, the conduit means being

adapted for connection to a source of fluid pressure differential and terminating in a first opening disposed on the inner face of said one leg member, and a second opening disposed on said distal outer face thereof in a position which is accessible for all manipulative and relative functional positions of said one leg member.

3,916,910

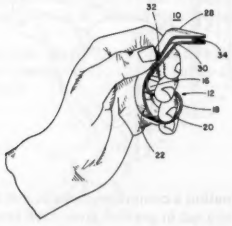
SURGICAL INSTRUMENT FOR PLASTIC SURGERY

Philip Seeling, 102 Fieldcrest Drive, North Syracuse, N.Y. 13212, and Burton David Brent, 521 S. Home Ave., Oak Park, Ill. 60304

Filed June 10, 1974, Ser. No. 477,653

Int. Cl.[2] A61B *17/30*

U.S. Cl. 128—354 **7 Claims**



1. A surgical instrument to be held in the hand of the user comprising,

an elongated hand manipulatable operating portion and an offset handle section at one end of the operating portion, said handle section defined by a strip having a first portion forming substantially an S shape in profile and extending from a first end at the top of the S to a second end, and

a second portion forming substantially a semicircle in profile and extending from said first portion second end to a third end adjacent to, overlying engaging and generally paralleling said first portion first end, said first and second portions defining an opening and adapted to be positioned in the hand with a pivot finger extending through said opening, and

said operating portion extending from said first and third ends generally tangentially to said second portion at said third end and formed to be held between the side of the forefinger and thumb for performing surgical procedures, said handle section being defined to one side of said operating portion for reception within the hand with said instrument adapted to be pivoted about said pivot finger to a storage position in the hand so as to free the fingers and thumb of the user for separate use.

3,916,911

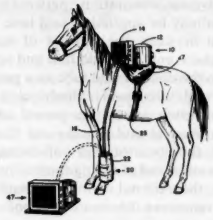
PORTABLE COOLING APPARATUS

James W. Sauder, San Ysidro, Calif., and Richard A. Rishel, Las Vegas, Nev., assignors to Vari-Temp Manufacturing Corporation, El Cajon, Calif.

Filed Dec. 7, 1973, Ser. No. 422,758

Int. Cl.[2] A61F *7/00*

U.S. Cl. 128—400 **11 Claims**



1. Portable apparatus for cooling a portion of a warm body comprising:

a. a ductile cooling coil for being formed to the general exterior shape of the body portion to be cooled,

b. a flexible jacket for receiving the coil and having means for securing the jacket around said body portion,

c. compressor and condenser means for liquefying a refrigerant composition,

d. conduit means for supplying said refrigerant to and from said cooling coil,

e. a battery for operating said compressor and condenser, and

f. a platform on which said compressor and condenser means are secured.

3,916,912

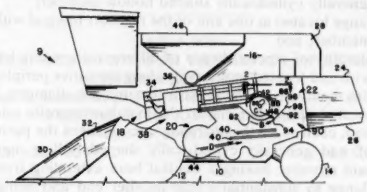
AXIAL FLOW COMBINE

Edward W. Rowland-Hill, Lancaster, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed June 3, 1974, Ser. No. 476,019

Int. Cl.[2] A01F *12/44*

U.S. Cl. 130—27 T **6 Claims**



1. In an axial flow combine having a frame adapted to travel across a field, axially arranged means mounted on said frame for threshing and separating grain from the remaining crop material and discharging said crop material at a rear end thereof, an operable discharge assembly mounted to said frame adjacent said rear end of said axially arranged means for receiving said crop material therefrom and propelling said material generally rearwardly out of the combine, said assembly creating a generally rearwardly and downwardly directed air stream when operating, grain receiving and cleaning means mounted to said frame spaced below said axially arranged means and said discharge assembly and extending to adjacent the rear of the combine, and means for passing a stream of air generally upwardly and rearwardly through said cleaning means to clean the grain received thereby, said stream of air generally converging toward said rearwardly and downwardly

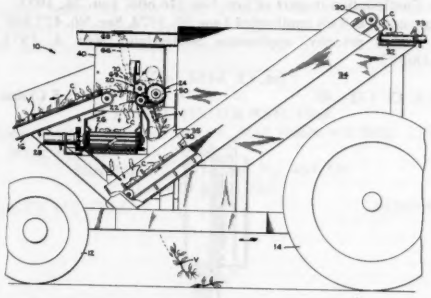
directed air stream created by said discharge assembly, wherein the improvement comprises:

means generally impervious to the passage of air being mounted to said frame generally adjacent the rear of said discharge assembly, said air impervious means extending from one location somewhat below said rear of said discharge assembly upwardly and rearwardly to another location more rearwardly of said discharge assembly than said one location but generally lower than said rearwardly propelling crop material for providing substantial separation between said discharge assembly air stream and said cleaning means air stream to thereby substantially prevent mingling of said air streams and formation of disruptive air currents therefrom which might interfere with cleaning of said grain received by said cleaning means.

3,916,913
VINE CROP HARVESTER PINCH OFF ROLLER WITH INSERTS

Olin L. Looker, Milford; Robert A. Johnson, Rossville; Frank F. Scribner, Hoopeston, and Larry L. Slates, Vermilion, all of Ill., assignors to FMC Corporated, San Jose, Calif.

Filed Mar. 21, 1974, Ser. No. 453,240
Int. Cl.[2] ; A01D *45/00*
U.S. Cl. 130—30 R **6 Claims**



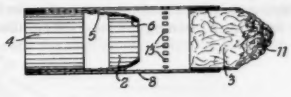
1. In a harvester for vine crops such as cucumbers, said harvester having a mobile frame, conveyor means for picking up a mass of vines and attached crop and delivering the mass to the nip of a pair of elongated contra-rotating cylindrical snapping rolls for pinching the crop off the vines as the vines are pulled through the rollers; the improvement wherein one of said snapping rolls is formed with a plurality of axially extending, undercut grooves, the contours of which lie in an isoscles trapezoid, and elongated axially extending, vine pull augmenting, trapezoidal section insert strips complementary to and mounted in said grooves, said strips each comprising a body of elastomeric, homogenously wear resistant material, said grooves and inserts having relative radial dimensions such that said inserts project past the periphery of said one snapping roller by a distance of about 3/32 inches.

3,916,914
SMOKING ARTICLES

Geoffrey O. Brooks, Southampton, and Robin A. Crellin, Romsey, both of England, assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed June 4, 1973, Ser. No. 366,756
Claims priority, application United Kingdom, June 6, 1972, 26368/72
Int. Cl.[2] A24B *15/027*; A24D *1/04*; A24F *1/02*
U.S. Cl. 131—10 A **7 Claims**

1. A smoking article comprising an elongated filling of smokable material burnable progressively, with formation of a coal at one end, when said article is smoked, said article including a first part which is displaceable longitudinally of the article and means for imparting longitudinal displacement of said first part in response to heat from the approaching coal when said article is smoked, said means comprising a heat

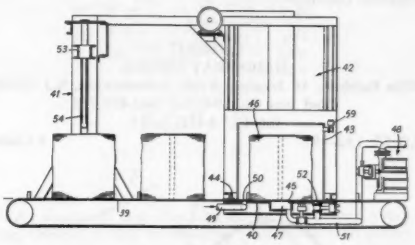


shrinkable film connecting said first part to a second part of said article.

3,916,915
TOBACCO MOISTENING METHOD AND APPARATUS THEREFOR

Richard E. G. Neville, Salisbury, and John A. Garrett, Andover, both of England, assignors to AMF Incorporated, White Plains, N.Y.

Filed Jan. 31, 1973, Ser. No. 328,486
Claims priority, application United Kingdom, Feb. 18, 1972, 7668/72
Int. Cl.[2] A24B *1/02*
U.S. Cl. 131—134 **23 Claims**



1. A process for moistening a cored body of tobacco having an elongated cavity open at both ends and the elongated wall of which is unsupported, comprising the steps of:

coring the body of tobacco to provide the elongated cavity;

placing the body of tobacco within an enclosed chamber and closing one end of the elongated cavity;

providing suction and steam to said chamber of which one is applied into the other end of the elongated cavity and the other is applied into the chamber outside of the body of tobacco; and

maintaining the suction and steam to said chamber until the body of tobacco has received a sufficient quantity of moisture from the steam.

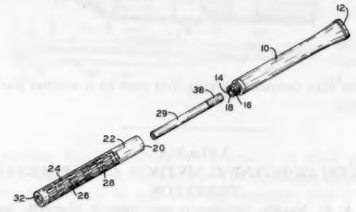
3,916,916
SHIELD FOR CIGARETTES AND CIGARS

Guy Bramucci, 7 Jones Ave., Braddock Hills, Pittsburgh, Pa. 15221

Filed Nov. 7, 1974, Ser. No. 521,549
Int. Cl.[2] A24F *13/16*
U.S. Cl. 131—175 **3 Claims**

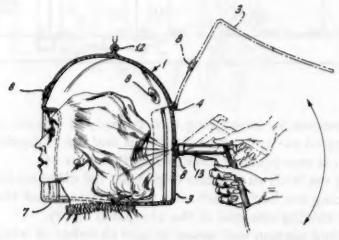
1. A protective device for cigarettes comprising a holder having a mouthpiece, a socket and a threaded sleeve, and a protective shield comprising a cylinder proportioned to be only slightly longer in diameter than a cigarette received therein and having a threaded portion adapted to be threadedly received on the threaded sleeve of said holder, said sleeve consisting of an elongated shell with means providing a plurality of longitudinally spaced elongated collinear slots each having its major dimension oriented parallel to the axis of the cylinder and arranged in sets of axial columns and transverse rows about the surface of the cylinder, and means providing circular openings between adjacent rows of slot means also

regularly disposed over the entirety of the cylindrical surface of said protective shield, said slots means and opening means forming access opening means by which air can communicate with the ignited end of the cigarette and smoke can be vented through the same such opening means, said circular opening



means and said elongated slot means being proportioned relative to the diameter and length of the holder to retain the generated ash therein even in the presence of external draft, said shield being characterized by non-flammable composition and proportioned to substantially cover the cigarette in its unburned condition.

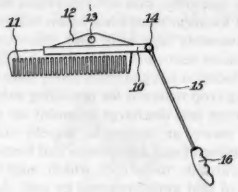
3,916,917
HAIRSPRAY SHIELD
Millie Hubbert, 16 Jennings Road, Manahawkin, N.J. 08050
Filed June 5, 1974, Ser. No. 476,755
Int. Cl.[2] A45D *19/16*
U.S. Cl. 132—9 **4 Claims**



1. A hairspray shield comprising a transparent, helmet-like structure adapted to be placed over the head of a person, said shield being formed to provide a space between it and the hair of said person but so as to fit closely around the face and neck of said person to provide a substantially vapor-tight enclosure, and being provided with self-sealing closures at a plurality of points spaced over its surface, said closures being adapted to permit the insertion of the nozzle of a hairspray applicator to apply hairspray through said shield at various points to the hair of said person, said shield being effective to confine the hairspray to a limited region in the vicinity of the head of the person with whom the shield is being used, and to prevent dispersion of the hairspray throughout a larger region.

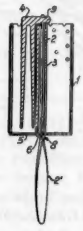
3,916,918
REHABILITATION COMB
Betty A. Spinks, General Delivery, Whonnock, British Columbia, Canada
Filed May 2, 1974, Ser. No. 466,320
Int. Cl.[2] A65D *24/00*
U.S. Cl. 132—11 R **3 Claims**

1. A hair combing device for use by a handicapped person in the form of a hair comb detachably fastened to a handle, comprising a handle member, one end of which is fastened to a universal joint attached to a clamp member, said clamp member engaging the two opposed sides of a comb so as to clamp



the comb in position, said comb being readily removable from the clamp member, by sliding, when it is desired to wash or replace the comb.

3,916,919
HAIR CURLER
Jacqueline Giordano, 1, Avenue Secretan, 1005 Lausanne, Switzerland
Continuation-in-part of Ser. No. 326,604, Jan. 26, 1973, abandoned. This application June 10, 1974, Ser. No. 477,988
Claims priority, application Switzerland, Feb. 4, 1972, 1686/72
Int. Cl. A45d *2/00*
U.S. Cl. 132—40 **5 Claims**

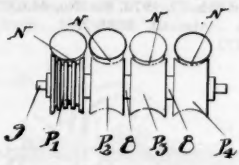


1. A hair curler comprising a hollow cylindrical roller; a support member located in said roller remote from an open end of the roller; an elastically extensible band held by said support member; a clip having interconnected first and second rod-like fingers, said first finger being substantially as long as said roller, said second finger having a rod-like hook member at a free end thereof, elastically held by said band to said support in said roller; and means for elastically spacing said clip, attached by said band and hook, from said support member, comprising an elongate member loosely mounted on said support member and extending toward said hook; said fingers and hook being integral parts of said clip.

3,916,920
FINGERNAIL POLISHING DEVICE
Sakichi Tsukamoto, 1,3-chome, Toyotama Kita, Nerima-ku, Tokyo, Japan
Filed Jan. 8, 1974, Ser. No. 431,737
Claims priority, application Japan, May 2, 1973, 48-48434; May 2, 1973, 48-48435; May 2, 1973, 48-48436; May 2, 1973, 48-48437
Int. Cl.[2] A45D *29/00*
U.S. Cl. 132—73 **3 Claims**

1. A fingernail polishing device comprising: at least one cylindrical polishing body and rotating means therefor; said body being formed of a plurality of separate circular buffs of different diameters, made from a soft but resilient material.

laterally piled in several layers, with separators therebetween, having slightly smaller diameters than said buffs; the diameters of said buffs gradually decreasing from both ends toward the center of said polishing body, with the outer circumferential surfaces of said at least one body constituting a sole inwardly curved concave circular arc configuration in each body, substantially similar to that of a fingernail to be polished; and a housing containing said at least one polishing body and said



driving means, and having in a wall portion thereof at least one aperture in the region of said at least one polishing body, to allow a fingernail to be polished by means of the rotation of said body, and other portions of the hand to be kept away from the polishing action; wherein the rotation of said at least one polishing body and the pressing of the fingernail thereagainst bends the outer buffs inwardly, which have a larger diameter, thereby preventing the fingernail from contacting the surfaces of said separators.

3,916,921

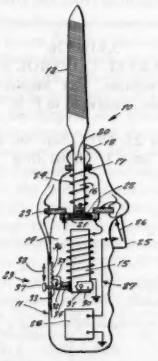
ELECTRIC FINGER NAIL FILE

Roger Pesola, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, New York, 10007

Filed May 13, 1974, Ser. No. 469,230

Int. Cl.² A45D *29/05*

U.S. Cl. 132—73.6 **3 Claims**



1. An electric finger nail file comprising an elongated hollow handle having an open end with an armature mounted axially therein, including a finger nail file detachably secured to said armature in axial alignment therewith and extending externally through said open end, in combination with a solenoid axially mounted in said handle adjacent the inner end of said armature including a source of electrical engergy in said handle for powering the solenoid, in further combination with a stop mounted in said handle and a coacting plate extending transversely from said armature adapted to engage said stop to limit outward movement of the armature, including an electric circuit interconnecting the stop, the plate, the solenoid, the source of electrical energy and a switch mounted externally on the handle whereby closure of said switch powers the solenoid and moves the armature towards the solenoid, causing the plate to move away from the stop and breaking the circuit, in further combination with resilient means biasing the armature and plate towards the stop for engagement therewith, in still further combination with manually operated external means for moving the solenoid axially to adjust the stroke of the armature.

3,916,922

ELECTRONIC COIN TESTER

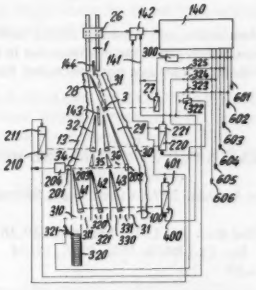
Georg J. Prümm, Kolner Strasse 235, 5275 Bergneustadt, Germany

Filed June 14, 1974, Ser. No. 479,409

Claims priority, application Germany, June 20, 1973, 2332362; June 20, 1973, 2332361

Int. Cl.² G07D *3/14*

U.S. Cl. 133—3 R **10 Claims**



1. An electronic coin checking device, comprising a measuring channel having an outlet, a controllable coin proper-/improper switch means for the reception or return of coins arranged at the outlet of said measuring channel, means defining a coin path of travel for the accepted coins, and at least one controllable follower switch means for sorting the proper coins in type-related outlet channels arranged beneath said proper/improper switch means in the coin path of travel for the accepted proper coins, and measuring- and evaluation circuit means including means for controlling the proper/improper switch means for a shorter period of time than the follower switch means.

3,916,923

AUTOMATIC WASHING AND SANITIZING APPARATUS FOR A PIPELINE MILKING SYSTEM

Donald L. Branton, Delavan, Wis., assignor to Sta-Rite Industries, Inc., Delavan, Wis.

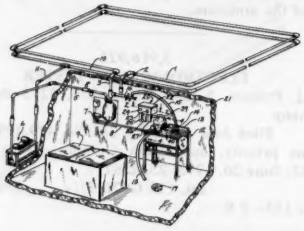
Filed July 16, 1973, Ser. No. 379,254

Int. Cl.² B08B *9/02*

U.S. Cl. 134—57 R **3 Claims**

1. An apparatus for cleaning and sanitizing a milking system, comprising washing means for flowing a washing solution through a milking system in a washing cycle, rinsing means for flowing a rinsing solution through said system in a rinsing cycle, sanitizing means for flowing a sanitizing solution through said system in a sanitizing cycle, control timer means to operate said washing means, said rinsing means and said sanitizing means to sequentially program said washing cycle, rinsing cycle, and sanitizing cycle, means responsive to completion of the rinsing cycle for deactivating said control timer means, second timer means capable of being set for a given time and operably connected to said control timer means, means responsive to said second timer means timing out for reactivating said control timer means whereby the control timer means acts to initiate operation of the sanitizing means to flow the sanitizing solution through said system for said

sanitizing cycle and safety timer means preset for a period of time greater than the combined period for said washing and rinsing cycle, said safety timer means being operably connected to said washing means and said rinsing means and



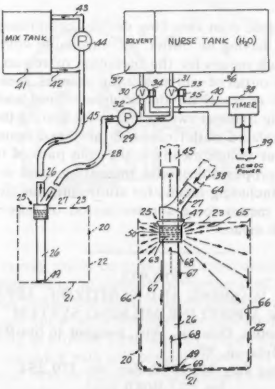
arranged to deactivate said washing means and said rinsing means when said safety timer means times out in the event the washing and rinsing cycles are not concluded through a malfunction.

3,916,924

APPARATUS FOR EMPTYING AND RINSING CONTAINERS

Francis E. Mc Gowan, 2773 Curtis Way, Sacramento, Calif. 95818

Filed Dec. 28, 1973, Ser. No. 429,261
Int. Cl.[2] B08B *3/02, 9/08, 15/04*
U.S. Cl. 134—95 **3 Claims**



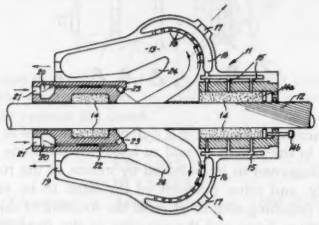
1. In a device providing a closed system for emptying and rinsing pesticide containers by eliminating exposure to toxic liquids during the evacuation and rinsing of the container said jet orifices including upper slots arranged on an upward slant, and said orifices including intermediate horizontally disposed slots, and said orifices further including downwardly disposed downwardly inclined slots all of said slots being located high on the nozzle, adjacent the container seal of the type that have an opening in the top thereof, an evacuation tube being vertically adjustable while still maintaining a closed system and including an inclined portion on the lower end thereof for permitting liquid to enter the lower end of the tube to leave the container, a nozzle mounted in said opening, said nozzle including a hose attachment, said nozzle including a seal fitting in the opening of the container for sealing the container and providing a closed system when the nozzle is in place, an air inlet check valve for said nozzle, and said nozzle being provided with a plurality of jet orifices located above the liquid level in the container.

3,916,925

CABLE CLEANING UNITS

Desmond George Crump, Wembley Downs, Australia, assignor to Phido (Wire Services) Co., Ltd

Filed Feb. 19, 1974, Ser. No. 443,325
Int. Cl.[2] B08B *3/02*
U.S. Cl. 134—172 **5 Claims**



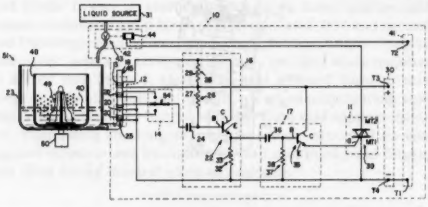
1. A cable cleaning unit comprising a chamber adapted to surround a section of the cable to be cleaned, a plurality of outlets located within the chamber through which jets of high pressure fluid are directed onto the surface of the cable, said outlets being arranged so that said jets strike the surface of of the cable at an angle inclined to the longitudinal axis of the cable being cleaned and are deflected from the surface of the cable in the direction of travel of the cable cleaning unit, the portion of the chamber receiving the deflected jets being arcuate so as to direct the fluid with dirt and other matter entrained therein away from the surface of the cable, and means for withdrawing fluid from the chamber.

3,916,926

LIQUID LEVEL CONTROL SYSTEM

Michael Smolin, Brookline, and Sanders Goldstein, Cambridge, both of Mass., assignors to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed July 25, 1974, Ser. No. 491,698
Int. Cl.[2] B08B *3/04*
U.S. Cl. 137—2 **27 Claims**



26. A method for controlling the level of a liquid in a container comprising the steps of:

a. introducing a liquid into a container through an electrically-operated valve from a liquid source;

b. connecting a detector/amplifier circuit to an inductance means so as to provide an oscillator circuit to provide electrical oscillations;

c. bringing a supply of liquid in close proximity to said inductance means so as to provide a liquid level approaching said inductance means;

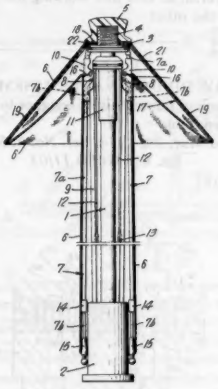
d. detecting a quenching of said oscillations in response to said level of said liquid coming into close proximity to said inductance means so as to produce an electrical signal in said detector/amplifier circuit; and

e. closing said electrically-operated valve in response to said electrical signal so as to stop the flow of liquid into said container.

3,916,927
UMBRELLA

Manfred Bremshey, Mount Royal, Canada, assignor to Telesco Brophey Limited, Montreal, Canada

Filed May 30, 1973, Ser. No. 365,247
Claims priority, application Germany, June 3, 1972, 2226785
Int. Cl.² A45B *19/06*
U.S. Cl. 135—26 **3 Claims**



1. An umbrella including a telescopic stick, a crown at one end of the stick, a cover fabric overlying the dome ribs and attached centrally above the crown, spreader means including a hub connected to the stick between the cover and the crown, fingers extending radially from the hub; chordal link members extending between the fingers and spaced radially from the hub near the end of the fingers, with the chordal link members being such that they are easily bent when the fingers are pressed downwardly from the crown when it is required to furl the umbrella cover; the hub, fingers and chordal members being formed integrally of flexible plastic material, said hub being flat and having an aperture through which said stick projects, the fingers being stepped down from said flat hub disposing the fingers in planes defined by adjacent pairs of dome ribs, the link members extending between adjacent fingers for integrating movement of the spreader.

3,916,928
ATTITUDE SENSITIVE FUEL TANK VENT VALVE

William K. Enoch, Hurst, Tex., assignor to Textron, Inc., Providence, R.I.

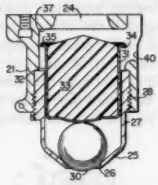
Filed Sept. 24, 1973, Ser. No. 399,698
Int. Cl.² F16K *17/36*
U.S. Cl. 137—39 **8 Claims**

1. An attitude sensitive control valve for an aircraft fuel tank and comprising:

a. a cup defining an elongated cylindrical walled chamber having a central port in the bottom and a lateral aperture in the side thereof, said cup adapted to be secured inverted to a fuel tank panel to vent said tank through said port,

b. a cap mounted at the mouth of said cup having end walls sloping to the axis of said cup,

c. an elongated cylindrical float in said cylindrical walled chamber in said cup having on the end adjacent said port a gasket to close said port when moved to the bottom of said cup and having on the opposite end a domed surface, and

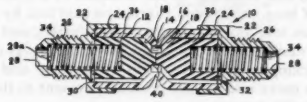


d. a heavy sphere in said cap which rolls along the walls of said cap to contact and move said float when said tank tilts to an angle where the thrust from said sphere exceeds the weight of said float.

3,916,929
SELF-SEALING BREAK-AWAY FITTING

Richard Edward Brown, Franklin, Tenn., assignor to Scovill Manufacturing Company, Waterbury, Conn.

Filed Aug. 16, 1974, Ser. No. 497,914
Int. Cl.² F16K *17/40*
U.S. Cl. 137—68 **7 Claims**



1. An inexpensive, compact, self-sealing break-away fitting comprising a simple tubular molded plastic housing portion having a neck comprising a V-shaped peripheral groove with a corresponding annular rib inside the housing portion, the neck being of reduced wall thickness, the neck disposed intermediate two halves, and a pair of molded end cap portions closing either end of the housing respectively, the housing having inside it and defined by the rib an axial central opening with valve seat means closely proximate to and surrounding the opening on each side and facing the adjacent end cap portions respectively, the end cap portions having openings each adapted to be connected to a conduit, plug means disposed in each half, spring means in each half disposed compressively between the plug means and the respective and cap portion and urging the associated plug means toward engagement with the adjacent seat to close it off, the plug means fixedly carrying centrally protuberances of lesser diameter than the central opening, and shoulder means in each half limiting movement of the plug means away from the seat, whereby when the housing portions are together, the protuberances engage each other at contact surfaces to mutually hold the plug means off the seats thereby permitting flow through the fitting, but when the fitting breaks at the neck, the spring means urge the respective plug means to seat, preventing leakage.

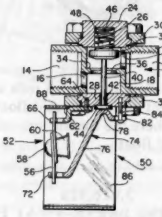
3,916,930
THERMAL SHUT-OFF VALVE

Linwood P. Erickson, Warren, R.I., assignor to G.W. Dahl Company, Inc., Bristol, R.I.

Filed Oct. 21, 1974, Ser. No. 516,653
Int. Cl.² F16K *17/38*
U.S. Cl. 137—75 **6 Claims**

1. A thermal shut-off valve comprising a valve housing, means within said housing movable between a first position

wherein said valve is open so as to permit flow therethrough and a second position wherein said valve is closed so as to block flow therethrough, means within said housing normally urging said movable means toward said second position, and thermally actuated means mounted outside of said housing normally maintaining said movable means in said first position, said thermally actuated means comprising a fusable link, first means holding one end of said link, and second means holding the other end of said link, said first and second means cooperating so as to hold said link under tension, said second means comprising a rigid lever arm having a fulcrum portion,



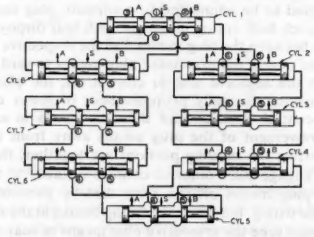
one end of said arm engaging said other end of said link, and means adjustably and releasably holding the other end of said arm in spaced relation to said housing with said fulcrum portion in blocking engagement with said movable means to prevent movement thereof to said second position, whereby when said link fuses due to the presence of a predetermined degree of heat, the tension exerted on said link by said lever arm causes said link to separate, thus releasing said lever arm whereby said fulcrum portion automatically moves away from said blocking engagement, thus permitting said movable means to move said second position pursuant to the impetus of said urging means.

3,916,931

FLUID TRANSLATING DEVICE HAVING EXPANSIBLE CHAMBERS

Edwin L. Shaw, Oxnard, and Everett H. Brewer, Thousand Oaks, both of Calif., assignors to Abex Corporation, New York, N.Y.

Filed June 12, 1972, Ser. No. 261,593
Int. Cl.[2] G05D *11/00;* **G01F** *3/14*
U.S. Cl. 137—101 **29 Claims**



1. A cyclically operable fluid translating device comprising an even number of expansible chamber units, at least a pair, each having a pair of opposed expansible chambers and each unit including a working member repetitiously movable between first and second positions to alternately expand and contract the expansible chambers related thereto, delivery of fluid under pressure from one of the units to a contracted expansible chamber of another unit driving the related working member of the other unit from one position to the other, each unit having first, second and third ports, a fourth port of each unit connected to an expansible chamber of another unit and a fifth port of each unit connected to another expansible chamber of another unit, internal fluid passage means in said units, valving means on each working member combined with said passage means for alternately in each unit

a. establishing connection of the fourth port with the first port and the fifth port with the second port when the working member is in the first position, and

b. establishing connection of the fourth port with the third port and the fifth port with the first port when the working member is in the second position,

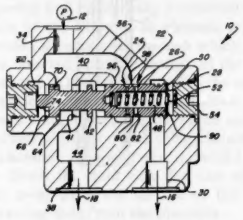
and the working member of one unit valving the contracted chamber of a second unit paired therewith to a source of fluid pressure prevailing at one of the first three ports of said one unit, and vice versa, so that one working member of the pair constantly lags the other.

3,916,932

FLOW DIVIDER VALVE ASSEMBLY

Clayton W. Thorson, Edina, Minn., assignor to Eaton Corporation, Cleveland, Ohio

Filed Mar. 28, 1974, Ser. No. 455,628
Int. Cl.[2] G05D *11/03*
U.S. Cl. 137—101 **8 Claims**



1. A valve assembly comprising a valve body having an inlet passage adapted to be connected with a source of fluid under pressure, an excess flow outlet passage, and a priority flow outlet passage, a valve spool movable between a first condition restricting fluid flow from said inlet passage to said excess flow outlet passage and a second condition restricting fluid flow from said inlet passage to said priority flow outlet passage, first aperture means formed in said valve spool for porting fluid flow from said inlet passage to said priority flow outlet passage when said valve spool is in said first and second conditions, second aperture means formed in said valve spool at a location spaced from said first aperture means, said second aperture means being effective to port fluid flow from said inlet passage to said priority flow outlet passage when said valve spool is in said first condition, means cooperating with said valve spool for preventing fluid flow through said second aperture means when said valve spool is in said second condition, and means for effecting movement of said valve spool between said first and second conditions in response to variations in the fluid pressure at one of said outlet passages relative to the fluid pressure at the other outlet passage.

3,916,933

MULTI-STAGE VALVE

Wilfred E. Boehringer, Fullerton, and James V. Walker, Redondo Beach, both of Calif., assignors to McDonnell Douglas Corporation, Santa Monica, Calif.

Filed Aug. 11, 1971, Ser. No. 170,782
Int. Cl. G05d *7/00, 11/02*
U.S. Cl. 137—102 **7 Claims**

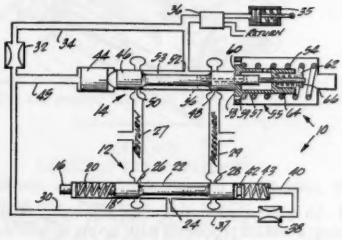
1. A valve for controlling the flow of medium to a reservoir and from a source of pressurized medium to operate actuator means, said valve including:

a source connection for conducting medium from the source of pressurized medium;

a return connection for conducting medium back to the reservoir

an output connection for conducting medium to and from the actuator means;

a first valve stage in communication with said source connection, said return connection and said output connection, said first valve stage including means to feed inputs thereto and means responsive to the inputs to predeterminately conduct pressurized medium flow from said source connection to said output connection, to predeterminately conduct pressurized medium flow from said output connection to said return connection, and to predeterminately block flow of medium between said output connection and said source and return connections;



differential pressure generating means connected between said first valve stage and said output connection to generate differential pressures thereacross when said first valve stage is conducting a flow of pressurized medium between said source connection and said output connection; and a second valve stage in communication with said source connection, said return connection and said output connection, said second valve stage including means in communication with said differential pressures and responsive thereto to augment the flow of pressurized medium from said first valve stage when a predetermined differential pressure is present across said differential pressure generating means.

3,916,934

TRANSMISSION CONTROL WITH ESSENTIALLY RATELESS REGULATOR VALVE

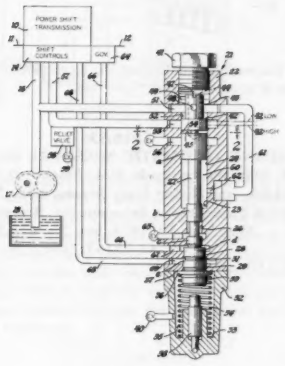
Richard J. Koenig, Carmel, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 11, 1974, Ser. No. 441,372

Int. Cl. G05d *16/10*

U.S. Cl. 137—115 **5 Claims**

1. In a regulator valve: primary fluid supply means having variable overage: secondary fluid supply means having limited flow requirements: regulator valve means having a body having a bore having in an opening direction order, a first overage land, a secondary supply port connected to said secondary supply means, a second overage land and an exhaust port; valve element means having a regulating land in said bore having a control edge, a second overage passage to said second overage port having full overage flow capacity and less axial length than said second overage land and the axial distance between said control edge and the remote edge of said second overage port being substantially equal to the axial length of the secondary supply port plus the second overage land reduced by the axial movement of the regulating land in the range of first overage regulating positions; chamber means between a portion of said bore and a portion of said valve element means connected to said primary fluid supply means to supply fluid to said control edge for regulated flow to said secondary supply port, to supply fluid to said second overage passage in said regulating land and to effectively act on an area of said valve element means; a spring acting on said valve element means providing an opposite valve closing bias force; said valve element means regulating main line pressure during low overage flow in a low overage flow regulating oscillating position with the control edge spaced from the first overage land and regulating first overage flow to said secondary supply port and said second overage port being blocked by said second overage land and with increasing overage flow said valve element means moving in an opening direction through a range of first overage regulating positions regulating increasing first overage flow and when the secondary supply means



flow requirements are substantially met connecting overage to said secondary supply port substantially without regulation and regulating second overage flow from said second overage port at said second overage land and connecting overage to said exhaust port in a range of second overage regulating positions up to high overage flow at a high overage regulating position providing a full range of regulatory positions from low to high flow having movement less than the axial length of the second overage land providing essentially rateless primary supply pressure regulation and a secondary fluid supply from low to high overage flow.

3,916,935

APPARATUS FOR THE STORAGE OF WEFT THREADS

Rachid Keldany, Forch, Zurich, Switzerland, assignor to Ruti Machinery Works Ltd., Ruti, Zurich, Switzerland

Filed June 3, 1974, Ser. No. 476,104

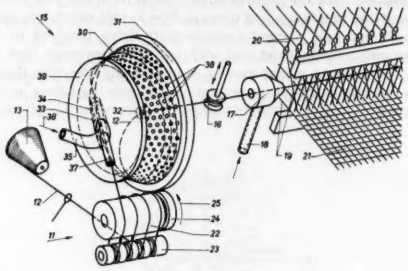
Claims priority, application Switzerland, June 8, 1973, 8325/73

Int. Cl.[2] **D03D** *47/36*

U.S. Cl. 139—122 R **14 Claims**

1. Apparatus for the storage of weft thread of variable length before insertion into a shed of a loom, comprising a shell wall formed as the generated surface of a truncated cone, there being arranged at the place where the base cross-section of the truncated cone is situated an end wall which is fixed to the shell wall and which defines centrally an aperture for the exit of the stored thread, a thread feeding nozzle producing an air stream for feeding the thread to be stored, said shell wall

being rotatable and provided with a plurality of apertures, said nozzle being directed toward the inner side of the shell wall to



convey the weft thread toward the inner side of said shell wall to cause it to rest thereon.

3,916,936

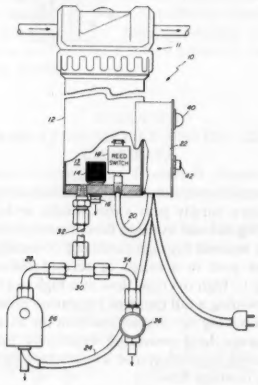
REDUNDANT AUTOMATIC MOISTURE DUMP SYSTEM

Henry F. Villaume, Intervale, N.H.; Stephen D. Collins, Bridgton, Maine, and Robert Gary Brauns, Glen, N.H., assignors to Howell Laboratories, Incorporated, Bridgton, Maine

Filed May 20, 1974, Ser. No. 471,284

Int. Cl.[2] F16T *1/00*

U.S. Cl. 137—204 **7 Claims**



1. A redundant automatic moisture dump system which comprises:

a. a housing which includes a sump;

b. a first valve assembly secured to the housing and disposed in the sump and adapted to discharge from the sump accumulated liquid when the liquid reaches a first level;

c. a second valve assembly which includes a sensor secured to the housing and spaced apart from the first valve assembly, the sensor adapted to provide a signal when the liquid in the sump reaches a second level which is higher than the first level and which second level is caused by failure of the first valve assembly to discharge the liquid material when the liquid material reaches the first level; and

a second valve external of the housing and secured to the bottom of the sump at a third level lower than the first level such that upon receipt of the signal from the sensor when the liquid has reached the second level, the liquid accumulated in the sump is discharged from the third level.

3,916,937

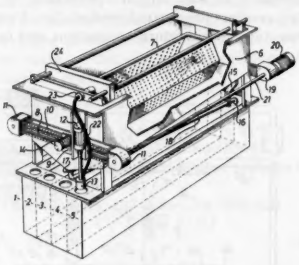
APPARATUS FOR SURFACE PROCESSING

Bror Erik Nyström, Rosenvagen 21, S-560 23 Bankeryd, Sweden

Filed July 8, 1974, Ser. No. 486,625

Int. Cl. B01k *3/00*; **F16k** *51/00*

U.S. Cl. 137—255 **9 Claims**



1. An apparatus for the surface processing of articles comprising: a surface processing bath having an inlet and an outlet for processing the articles utilizing a plurality of different processing liquids, a plurality of collaterally arranged supply chambers each containing a respective one of said processing liquids; pump means for delivering the processing liquid from each of said supply chambers to said processing bath; said pump means having a suction orifice which is movable above and along the adjacent ends of said supply chambers at one end of said collateral arrangement thereof, and vertically movable for selective immersion into said adjacent ends of the supply chambers and an outlet coupled to the inlet of said processing bath; duct means coupled to the outlet of said processing bath for delivering processing liquid from the processing bath to respective ones of said supply chambers, said duct means having an outlet orifice movable over and along the adjacent ends of the supply chambers at the other end of said collaterally arranged supply chambers synchronously with the movement of said pump means above and along said one end of the collaterally arranged supply chambers whereby as said pump means delivers a processing liquid from a respective one of said supply chambers to the processing bath through the inlet thereof, said duct means simultaneously returns that processing liquid from the bath to said respective one of the supply chambers through the outlet orifice thereof.

3,916,938

EMERGENCY GAS TANK APPARATUS

J. Roy Hack, 4363 E. Illinois St., Tucson, Ariz. 85714

Filed Oct. 15, 1974, Ser. No. 514,553

Int. Cl.[2] B65D *25/00*

U.S. Cl. 137—256 **2 Claims**

1. Emergency fuel tank apparatus, comprising, in combination:

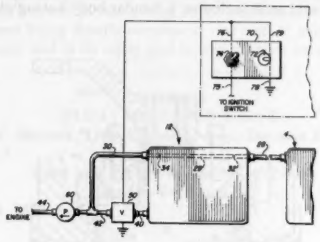
fuel pump means for providing a flow of fuel from a main fuel tank;

an emergency fuel tank for holding a quantity of fuel, including a top portion and a bottom portion and side and end portions intermediate the top and bottom portions;

a first fuel line extending from the main fuel tank into, through, and out of the emergency tank adjacent the top portion of the tank and to the fuel pump means;

hole means in the first fuel line within the emergency fuel tank and spaced apart from each other on the fuel line to provide fuel for the emergency fuel tank from the main fuel tank;

a second fuel line extending from the emergency fuel tank to the first fuel line to provide a flow of fuel from the emergency fuel tank in response to the fuel pump means; and

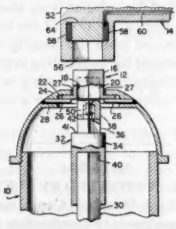


valve means in the second fuel line for controlling the flow of fuel in the second fuel line.

3,916,939
LOCKTOP FIRE HYDRANT

Clarence Gillard, c/o Schulman, Gasarch & Scheichet, P.C. 555 Madison Ave., New York, N.Y. 10022

Filed Nov. 25, 1974, Ser. No. 526,452
Int. Cl.² F16K *31/06, 35/06*
U.S. Cl. 137—296 **6 Claims**



1. A locking mechanism for a fire hydrant comprising an upper hydrant wall having an aperture therein, a hydrant control shaft within said hydrant, means slidably mounted on said hydrant control shaft for selectively rotating said shaft, a socket mounting rotatably disposed within said aperture and supported by said upper hydrant wall, said mounting having an internal cavity for receiving and coupling said slidably mounted means for rotation, and electromagnetic means for selectively causing said slidably mounted means to move into said cavity to permit the transfer of rotational force from said mounting to said control shaft.

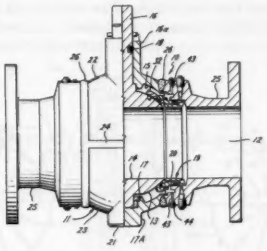
3,916,940
VALVE

Herbert Allen, Houston, Tex., assignor to Cameron Iron Works, Inc., Houston, Tex.

Filed Jan. 14, 1974, Ser. No. 433,270
Int. Cl.² F16K *49/00, 5/06*
U.S. Cl. 137—340 **10 Claims**

1. A valve, comprising a body having a flowway therethrough and a substantially cicumferential weldment thereabout, a closure member mounted in the body for movement between positions opening and closing the flowway, a heat destructible part captured within and engaging the body near and generally concentric with the weldment, means providing an annular passageway within the body which is generally concentric with the weldment and includes walls on said body which are spaced from the weldment and relatively near the heat desctructible part, and means including a pair of circumferentially spaced apart ports connecting said annular passageway with the exterior of said body to permit coolant to be circulated through said passageway in order to reduce the transmission of heat to said part during formation of the weldment.

8. In a method of manufacturing a valve having parts which include a body, a closure member mounted in the body for opening and closing a flowway therethrough, an annular seat captured within the body for engaging a side of the closure

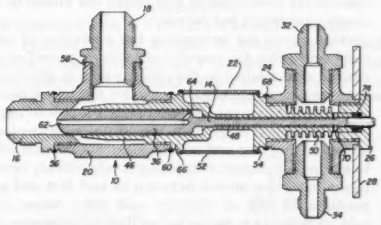


member, and seal means adapted to engage the body and seat, and wherein a weldment is to be formed about the body near the seal means, the steps of forming the parts of the valve in such a manner that, upon their assembly and prior to formation of the weldment, they define an annular passageway in the body which includes walls generally intermediate and in heat conductive relation with the weldment and seal means, and circulating a coolant through the passageway during formation of said weldment.

3,916,941
THROTTLE VALVE ASSEMBLY

Joe D. Usry, Salt Lake City, Utah, assignor to E-Systems, Inc., Dallas, Tex.

Filed Apr. 24, 1974, Ser. No. 463,552
Int. Cl.² F16K *49/00*
U.S. Cl. 137—340 **9 Claims**

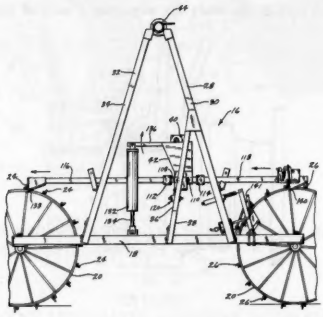


1. A flow control assembly, comprising in combination:
a fluid throttle valve including a housing having an inlet port and an outlet port opening into a chamber;
a pintle guide connected to said housing and extending into the chamber;
a pintle in the guide, said pintle including a valve stem extending from the housing;
an actuator coupled to the valve stem to move the pintle for controlling the flow of fluid between the inlet and the outlet ports;
a cooling chamber enclosing said valve stem between the housing of said throttle valve and said actuator; and
a hollow standoff means connecting said throttle valve housing and said cooling chamber, said hollow standoff means enclosing said valve stem therein.

3,916,942
AIR-POWERED SPRINKLER SYSTEM

Loren R. Townsend, Sidney, Nebr. 69162

Filed Jan. 10, 1975, Ser. No. 540,112
Int. Cl.² B05B 3/12
U.S. Cl. 137—344 **9 Claims**



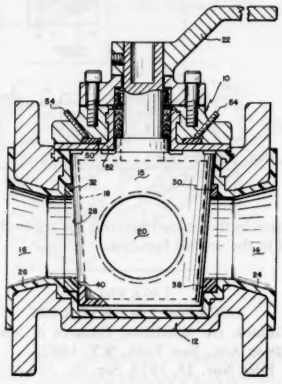
1. A self-propelled sprinkling system, comprising,
a water supply pipe movable about a central pivot point,
a plurality of spaced apart, wheeled drive towers supporting said supply pipe above the area to be sprinkled,
an air operated drive means on each of said towers to propel said towers to move said towers and supply pipe about said central pivot point,
a source of compressed air for supplying air under pressure to said drive means,
each of said towers comprising a frame means having a pair of spaced apart drive wheels rotatably mounted thereon, a trojan bar means reciprocatably mounted on said frame means and movable between first and second positions for engagement with at least one of said drive wheels for driving said wheel when said trojan bar means moves in at least one direction,
an air cylinder mounted on said frame means and being operatively connected to said trojan bar means to reciprocate said trojan bar means,
a control means for controlling the operation of said air cylinder so that the associated tower is propelled at the desired rate relative to the other towers in the system,
said control means comprising a valve means connected to said source of air pressure and having a pair of opposing valve plungers extending therefrom, said trojan bar means having first and second elements thereon adapted to alternately engage said plungers respectively upon said trojan bar being moved between its said first and second positions by said air cylinder, said valve means causing said air cylinder to be cycled so that reciprocating movement of said trojan bar means is obtained.

3,916,943
PLASTIC LINED PLUG VALVE

Clarence H. Hester, Houston; Willard L. Petrosky, Alief; Joseph T. Stewart, Jr.; Burleigh R. Murphree, both of Houston, and Gail W. Graves, Richmond, all of Tex., assignors to John L. Dore' Co., Fort Bend County, Tex.

Filed Aug. 27, 1973, Ser. No. 392,031
Int. Cl.² F16K 27/00, 5/06
U.S. Cl. 137—375 **2 Claims**

1. A plastic lined plug valve comprising,
a body having an inlet and an outlet,
a plug valve element positioned in the body between the inlet and the outlet, said valve element including a conical section,
the entire interior of the body including the inlet and the outlet and the exterior of the plug valve element being coated with a thermoplastic coating,
a replaceable seal in the body adjacent and encircling each of the inlet and the outlet inside of the valve body coating, each of said seals including a tubular body having a seating

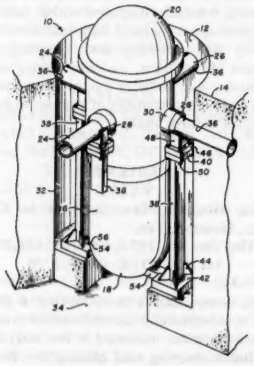


surface at one end of the tubular body shaped to coact with the surface of the conical section of the valve element, said seating surfaces spaced from the coating on the valve body and toward the element for preventing engagement between the coating on the body and the coating on the element, and means urging the valve element into a sealing relationship with said seals.

3,916,944
REACTOR VESSEL SUPPORTED BY FLEXURE MEMBER

James Darwin Crawford, Windsor, Conn., and Bernd Pankow, Westfield, Mass., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed June 28, 1973, Ser. No. 374,716
Int. Cl. F16l 3/00
U.S. Cl. 137—376 **9 Claims**



1. The combination comprising:
a. a support base;
b. a pressure vessel having a vertically disposed axis and containing a material capable of generating substantial heat therein whereby said vessel is caused to undergo

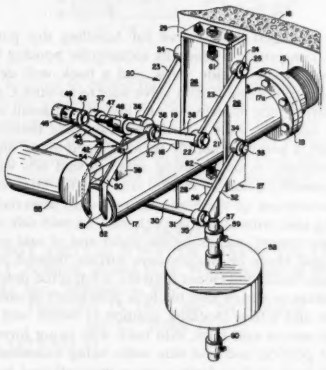
thermally induced radial displacements with respect to said support base; and

c. means for vertically supporting said pressure vessel upon said support base including a plurality of vertical columns arranged for flexure in a direction substantially radial with respect to the axis of said vessel, each of said columns being fixedly secured at one end to said pressure vessel and at its other end to said support base.

3,916,945
FLOAT OPERATED VALVE

David F. Bennett, 1100 Fleetwood Ave., Daytona Beach, Fla. 32014

Filed May 23, 1974, Ser. No. 472,808
Int. Cl.[2] F16K 31/18
U.S. Cl. 137—445 6 Claims



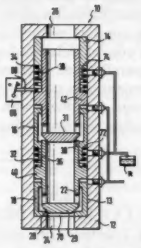
1. A float operated valve comprising a conduit having an open end defining a valve seat, a valve, means swingably supporting said valve for movement into and out of engagement with said valve seat, a liquid level responsive float, means including a parallelogram linkage system connecting said float to the valve whereby an up or down movement of the float will produce a swinging movement of the valve into or out of engagement with said valve seat, said parallelogram linkage system including a pair of rigid links, means pivotally supporting corresponding ends of said links on said conduit, means connected to said float and to which the opposite ends of said links are pivotally connected in spaced apart relation to one another such that said links are disposed parallel to one another, one of said links comprising an arm of a bellcrank, said means swingably supporting the valve including a second bellcrank having one arm connected to and supporting the valve, and a rod connecting the other arm of the first mentioned bellcrank to the other arm of said second bellcrank for causing said bellcranks to swing in unison about parallel axes in response to up and down movement of the float.

3,916,946
SAFETY CHECK VALVE FOR PRESSURE FLUID OPERATED APPARATUS IN PARTICULAR PRESSES

Helmut Motzer, Echterdingen, Germany, assignor to Herion-Werke KB, Germany

Filed Nov. 16, 1973, Ser. No. 416,653
Claims priority, application Germany, Feb. 26, 1973, 2309552
Int. Cl.[2] F16K 15/18
U.S. Cl. 137—512.2 11 Claims

1. A safety check valve for controlling flow of pressure fluid in a supply line for pressure fluid operated apparatus, in particular presses, comprising a cylindrical housing with an axial bore, an inlet opening at one end of said bore and an outlet opening at the opposite end of said bore, said bore providing a fluid passageway through the housing between said inlet opening and said outlet opening, first and second control pistons disposed in tandem in said bore between said inlet opening and said outlet opening, each of said control pistons having at the end thereof nearest said inlet opening a valve portion with a working face, a first annular valve seat surrounding said inlet opening and engageable by the working face of the valve portion of said first control piston to close said passageway, a second annular valve seat located between said inlet opening and said outlet opening and engageable by the working face of the valve portion of said second control piston to close said passageway, means biasing the first and second control pistons toward their respective valve seats to

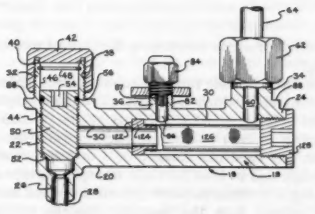


close the valve, said pistons being movable by line pressure applied through said inlet opening and acting on said working faces of said valve portions in a direction against the bias of said biasing means to open said valve and being urged against said valve seats by line pressure applied in the reverse direction through said outlet opening to close said valve and thereby prevent flow of line fluid in said reverse direction, said control pistons having control surfaces isolated from said passageway and from line pressure, and controllable means for exerting fluid pressure on said control surfaces to move said control pistons against line pressure applied through said outlet opening and against the bias of said biasing means to open the valve and thereby permit controlled flow of said line fluid in said reverse direction.

3,916,947
REFRIGERATION SYSTEM VALVED FITTING

Paul M. Holmes, Jackson; Douglas M. Brant, Mason; Thomas J. Swope, Jackson, and Joseph F. Reinker, Jr., Parma, all of Mich., assignors to Aeroquip Corporation, Jackson, Mich.

Filed Mar. 13, 1974, Ser. No. 450,584
Int. Cl.[2] E03B 7/07
U.S. Cl. 137—544 8 Claims



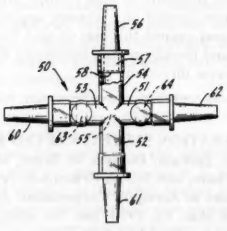
1. A valved fitting for refrigeration systems characterized by ease of access thereto comprising, in combination, an elongated tubular manifold having an axis, an elongated wall and first and second ends, an elongated tubular internally threaded shutoff valve receiving stem mounted on said manifold in communication therewith having an axis radial to said manifold axis and an open end, a flow passage defined on said

manifold selectively communicating therewith substantially radially disposed to said manifold axis and in axial alignment with said valve receiving stem, said valve receiving stem and flow passage located adjacent said first manifold end, a valve seat defined in said manifold adjacent said flow passage, a threaded valve threadedly received within said manifold in alignment with said stem and selectively engageable with said valve seat upon radial movement with respect to said manifold axis controlling flow between said manifold and flow passage, said valve being accessible through said open end for radial adjustment thereof with respect to said manifold axis, an elongated tubular conduit fitting stem mounted upon said manifold in communication therewith adjacent said second end having an axis radial to said manifold axis and in axial spaced relation to said valve receiving stem, said conduit fitting stem including conduit mounting means for mounting a conduit thereon in coaxial relationship therewith, the axes of said stems being parallel and coplanar whereby access to said valve and attachment of a conduit to said fitting are in a common radial direction and plane with respect to said manifold axis, and a mounting surface defined on said manifold.

3,916,948
CONTROL VALVE FOR MEDICINAL FLUIDS

Thomas A. Benjamin, Deerfield, Ill., assignor to Medical Environment Devices, Inc., Wheeling, Ill.

Continuation-in-part of Ser. No. 383,161, July 27, 1973, abandoned. This application Dec. 3, 1973, Ser. No. 420,867
Int. Cl.² F16K *31/00*
U.S. Cl. 137—608 **8 Claims**



1. A valve for use in controlling the flow of medicinal fluids including:

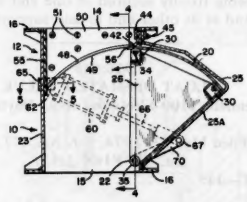
at least three flexible tubes of equal interior diameter made of a material which is at least partially transparent, said tubes being connected together at one of their ends and forming an inter-communicating central crossover;

at least one rigid ball formed of a material readily visible through said at least partially transparent tubes, said ball having a continuous outer spherical surface and a diameter greater than the interior diameter of said tubes wherein the rigid ball is capable of being firmly lodged within any of said tubes and is capable of bein switched between any of said tubes by external squeezing forces being applied to the tube, forcing the ball out of one tube, through said central crossover, and into another desired tube, a ball positioned in any one tube permitting communication between other tubes, with movement of the ball between different tubes changing the pattern of inter-tube flow.

3,916,949
ENCLOSED GATE VALVE

George W. Armstrong, P.O. Box 507, Fairborn, Ohio 45324

Filed Oct. 1, 1973, Ser. No. 402,408
Int. Cl.² F16K *1/20*
U.S. Cl. 137—609 **1 Claim**



1. An enclosed blade valve for handling dry particulate material, comprising a generally rectangular housing having a front wall, a pair of side walls, and a back wall defining a passageway extending from a valve inlet to an outlet, a curved flow control blade movable in said housing adjacent said inlet between said side walls with the concave side thereof facing said outlet, a pair of generally sector-shaped blade supporting arms positioned in said housing adjacent said side walls, said arms presenting a narrow frontal area to offer little resistance to the movement of the blade through said material, means mounting said arms at the apex thereof on said side walls for pivotal movement, means on the wider end of said arms supporting said blade on the concave surface thereof providing for arcuate blade movement between a retracted flow permitting position in which said blade is positioned at one side of said inlet and a flow blocking position in which said blade is extended across said inlet, said back wall being formed with an offset portion and said side walls being extended to join with said back wall to form a space proportioned to receive and enclose said blade in the retracted position thereof, said offset portion having a lower inclined surface in underlying relation to said blade in the retracted position, the slope of said inclined surface being such as to be self-cleaning by gravity of any material which may fall thereon, seal means at said inlet for sealing said blade with respect to said housing walls in the closed position thereof, and means for moving said blade between its said positions, offset tab means at the forward edge of said blade and tab-engaging retainer means on said arms, said tab and retainer means being engageable by arcuate sliding movement of the blade with respect to said arms providing an attachment free of threaded fasteners for the forward edge of said blade on said arms.

3,916,950
SEAL CONSTRUCTION

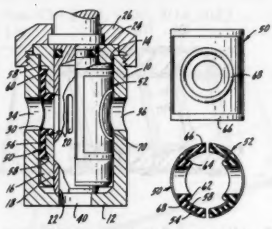
Paul A. Mongerson, Elyria, and Alfred M. Moen, Grafton, both of Ohio, assignors to Stanadyne, Inc., Windsor, Conn., a part interest

Division of Ser. No. 303,543, Nov. 3, 1972, Pat. No. 3,840,048, which is a continuation-in-part of Ser. No. 268,542, July 3, 1972, abandoned, which is a continuation-in-part of Ser. No. 147,358, May 27, 1971, abandoned. This application Jan. 17, 1974, Ser. No. 434,131
Int. Cl.² F16K *11/02*
U.S. Cl. 137—625.41 **5 Claims**

1. A generally cylindrical seal for use in a valve having a hollow sleeve, a fluid mixing piston movable within the sleeve, spaced fluid inlet ports in the sleeve communicating with the piston, a sleeve outlet and a housing enclosing the sleeve and piston,

said seal being formed by two generally symmetrical parts, with each part having a port seal portion and a body portion, each port seal portion extending through a sleeve port and having a curved inner rim formed to provide minimum sealing contact with the piston, each body

portion being integral with a port seal portion and having an internal generally cylindrical surface fitted against the exterior surface of the sleeve, each body portion having portions thereof in sealing contact with an internal surface of the housing, each body portion cooperating with

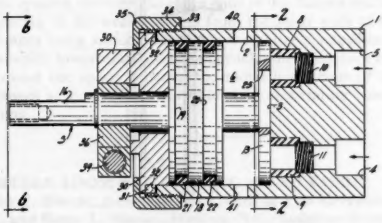


the housing to define fluid chamber means in alignment with its associated port seal portion, with fluid in the chamber means providing pressure to urge said port seal portion toward the piston, said port seal portions being freely movable relative to the sleeve ports for applying sealing pressure by the rims against the piston.

3,916,951
HOT AND COLD WATER MIXING VALVE

William C. Schmitt, Brown Deer, Wis., assignor to Milwaukee Faucets, Inc., Milwaukee, Wis.

Filed May 23, 1974, Ser. No. 472,678
Int. Cl.[2] F16K *11/085*
U.S. Cl. 137—625.41 4 Claims

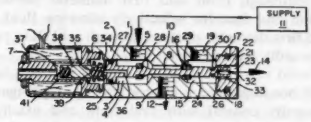


1. A hot and cold water mixing valve comprising a cylindrical cartridge body having a bore therein including an inner end wall, said cartridge body also having separate hot and cold water inlet ports extending separately through said body and opening into said bore through said inner end wall, a rotatable stem in said bore and including an operating portion extending from said cartridge and also including a radially enlarged cylindrical portion rotatable in said bore, fluid sealing means including a pair of axially spaced apart O-ring seals between said enlarged cylindrical portion and said bore, said enlarged cylindrical portion being of sufficient axial length so as to accommodate said pair of O-ring seals and provide a good rotatable bearing surface for said stem to prevent tipping of the stem, said stem also including a valve disc at its inner end and which disc abuts against said inner end wall of said bore and is rotatable in respect thereto, said enlarged portion of said stem being axially spaced from said valve disc so as to define a hot and cold water mixing chamber with said bore, said disc having openings which are registerable with said hot and cold water inlet ports of said cartridge body, and a removable threaded cap nut threadably engaged with said stem for holding said rotatable stem captive in said cartridge.

3,916,952
ENERGY CONSERVING TANDEM DIRECTIONAL VALVE

Richard S. Pauliukonis, 6660 Greenbriar Drive, Parma Heights, Ohio 44130

Continuation of Ser. No. 243,171, April 12, 1972, Pat. No. 3,824,898. This application Dec. 10, 1973, Ser. No. 423,534
Int. Cl.[2] F15B *13/042*; F16K *11/02, 31/40*
U.S. Cl. 137—625.64 6 Claims



1. An energy conserving tandem directional valve comprising:

a multiported longitudinal valve housing having first and second ends interconnected by a bore extending therethrough, said bore having a first diameter portion adjacent said first end extending inwardly therefrom toward said second end, a second diameter portion adjacent said second end extending inwardly therefrom toward said first end and a third diameter portion interconnecting the innermost ends of said first and second diameters, said first and second diameter portions having larger diameters than said third diameter portion, including shoulders at the interconnection of said diameters with a first shoulder facing said housing first end and a second shoulder facing said housing second end, said housing further including at least three perpendicular ports extending through said housing and communicating with said bore extending therethrough, one of said ports comprising a first fluid supply port communicating with said first diameter portion adjacent said first housing end and adaptable to be connected to the pressurized fluid source, another of said ports comprising a second fluid port communicating with said third diameter portion and adaptable to be connected to a first fluid receiver, the remaining port comprising a third fluid port communicating with said second diameter portion adjacent said second housing end and adaptable to be connected to a second fluid receiver, said second bore end being closed by an end cap provided with a central opening therethrough comprising a main valve exhaust port open to atmosphere, said second and said third ports receiving and exhausting said pressurized fluid from said first fluid port in tandem flow therethrough,

said first bore end receiving slidably an elongated stem with a piston at one end and a smaller diameter opposite stem end round, said piston being of close sliding fit with the housing having a seal received slidably inside said first diameter portion with said piston head including an end face, a second seal in said stem received inside said first diameter portion and spaced along said stem from said piston adjacent said first shoulder with a seal diameter of less than the diameter of said piston but greater than said third diameter portion, a third seal in said stem received inside said second diameter portion and spaced along said stem adjacent said second shoulder with a seal diameter greater than said third diameter portion but less than the diameters of said piston and of said second diameter portion, and a final seal on said opposite stem end adjacent said end cap sized to permit close sliding fit inside said exhaust port of said end cap opening,

said stem being selectively shifted between a first position wherein said fluid communication is permitted between said fluid supply and said first fluid receiver port but is precluded from entering said second fluid receiver port by said third seal being firmly seated against said second shoulder while simultaneously allowing fluid communica-

tion between said second fluid receiver port and said exhaust port, and a second position wherein fluid communication is permitted between said first and second receiver ports while having said second seal firmly seated against said first shoulder to preclude fluid communication between said fluid supply port and said first fluid receiver port and also having said final seal engaged inside said main valve exhaust port to preclude fluid exhaust into the atmosphere,

said stem further including a small fluid passage extending therethrough from said first diameter portion to said piston end face for selectively allowing fluid flow from said first diameter portion through said fluid passage and outwardly from said end face,

a solenoid valve operator disposed at said first bore end of said housing, said operator having a plunger disposed generally coaxial with said stem and axially movable selectively in an operative relationship with solenoid energization between an open position spaced from said end face of said piston and defining a fluid cavity therebetween and a closed position in blocking engagement with said small passage at said end face, wherein when said plunger is in said closed position said stem is retained in said first position by fluid entering a first annulus formed between said stem and said first diameter portion said fluid acting on said piston with a force large enough to maintain said third seal firmly seated against said second shoulder when said stem is in said first position with said valve being open to full pressure of the working fluid for feeding said first receiver port while said main valve exhaust port is open to atmosphere allowing said second receiver port to simultaneously exhaust, and wherein when said plunger is in said open position said stem is shifted to said second valve closed position by fluid entering said cavity through said passage in said piston end face and acting against said piston head end face exposed to said cavity with a force large enough to maintain said second seal firmly seated against said first shoulder while allowing full pressure from said first receiver port to enter said second receiver port,

said solenoid valve operator further including means for exhausting fluid from said cavity as said plunger is moved from said open toward said closed position, including spring biasing means for continuously exerting a biasing force on said plunger to force said plunger toward said closed position, whereby when said solenoid valve operator is de-energized said spring biasing means forces said plunger from said open to said closed position, energization of said solenoid causing said plunger to overcome said biasing force of said biasing means in moving from said closed to said open position.

3,916,953

HEAT INSULATING HOSE

Akio Nagayoshi, Sakai; Kenji Morii, Osaka, and Yasunori Sakai, Sakai, Japan, assignors to Mitsubishi Petrachemical Co., Ltd. and U C Sangyo Co., Ltd., Japan

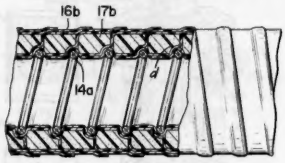
Continuation-in-part of Ser. No. 373,306, June 25, 1973, abandoned. This application Sept. 17, 1973, Ser. No. 397,802

Claims priority, application Japan, June 24, 1972, 47-75005; Nov. 20, 1972, 47-134053

Int. Cl.[2] F16L *11/08, 11/12*

U.S. Cl. 138—129 **13 Claims**

1. A heat insulating hose comprising a first flexible strip of heat insulating material and a wider thinner second flexible strip of plastic material which extends laterally beyond both edges of said first strip, said second strip having first and second side portions and a middle portion between said side portions, said first and second strips being wound helically together as a composite strip in successive overlapping convolutions with said first side portion of said second strip at least partially underlying said first strip and underlying a succeeding convolution of said composite strip so that overlapping first side portions of successive convolutions of said second strip form a continuous inner lining of the hose; said second side portion of said second strip overlying a preceding convolution of said first strip and partially underlying said second side portion of a succeeding convolution of said second strip so that overlapping second side portions of successive convolutions of said second strip form a continuous outer covering of the hose, said first strip being confined between said inner lining and said outer covering of the hose, said middle portion of said second strip connecting said first and second side portions thereof and being disposed between successive convolutions of said first strip, said overlapping portions of said second strip being bonded together to form a continuous hose.



3,916,954

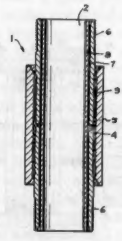
LONG PATH INSULATING DEVICE FOR USE IN A PIPELINE

Eugene Hochhausen, 14007 - 80 Ave., Edmonton, Alberta, Canada

Filed Dec. 10, 1973, Ser. No. 423,320

Int. Cl.[2] F16L *9/18, 9/14, 13/11*

U.S. Cl. 138—149 **5 Claims**



1. A long path insulating device for use in a pipeline carrying fluid, comprising:

a rigid, non-conductive, glass-reinforced, thermo-setting plastic tube;

a pair of coaxial, steel tubes surrounding the plastic tube and spaced apart longitudinally to form a narrow gap;

the wall thickness of the plastic tube being greater than the width of the gap;

a tubular, steel jacket sleeve surrounding the steel tubes and positioned intermediate the outer ends thereof;

said plastic and steel tubes forming a first annular space between them and said steel tubes and sleeve forming a second annular space between them; and

a solid, non-conductive bonding material filling the first and second annular spaces and the gap to bond the tubular parts together to form a sealed and solid unit, said bonding material when in place in the device being capable of resisting pressure up to 4,000 p.s.i. without being extruded;

said plastic tube extending longitudinally beyond each edge of the gap a sufficient distance to prevent current skip when the device is operative.

3,916,955
TIGHTENING LAYER ON INSULATED PIPE LINES

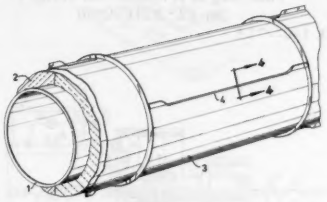
Sture Netterstedt, and Bengt Lindstrand, both of Fagersta, Sweden, assignors to Fagersta AB, Fagersta, Sweden

Filed May 6, 1974, Ser. No. 467,478

Claims priority, application Sweden, May 11, 1973, 7306668

Int. Cl.² F16L *9/00, 9/14, 9/22*

U.S. Cl. 138—155 **6 Claims**



1. An expansion absorbing tightening layer for insulated pipe lines, comprising:

a plurality of longitudinally extending sections attached end to end, each longitudinally extending section being made up of one or more steel plates, which, taken together, surround the insulation of the pipe, each section including at least one longitudinally extending joint formed by a pair of opposed longitudinally extending steel plate edges and transversely extending end joints formed by facing end edges of adjacent sections for connecting each section to its adjacent sections,

each of said longitudinal and end joints comprising a flange formed along each edge of the joint and turned radially outwardly at said edge, said outwardly turned flanges at each joint being welded together at a radial outward portion thereof, the radial inward ends of the flanges at each joint being normally spaced apart from each other, the spacing between the inner ends of the flanges and the spacing of the weld outward from the inner ends of the flanges being selected such that the plates are resiliently movable towards and away from each other to reduce and expand the space between the radial inner ends of the flanges to compensate for changing temperature conditions.

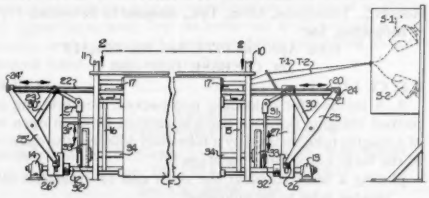
3,916,956
NEEDLE LOOM FOR WEAVING PLUSH FABRIC

Stephen C. Harris; John F. Damon, both of East Greenwich, R.I., and Roger L. Massey, Hickory, N.C., assignors to Joan Fabrics Corporation, Lowell, Mass.

Filed Dec. 10, 1974, Ser. No. 531,247

Int. Cl.² D03D *39/16, 47/34*

U.S. Cl. 139—21 **9 Claims**



1. In a loom for weaving plush fabric of warp and weft threads and including a reed movable between a forward or beat-up position where successive weft threads are moved against the fell of the fabric and a rearmost position where the warp threads form upper and lower open sheds for introduction of respective weft threads therethrough, a pair of weft inserting needles supported at one side of said loom for reciprocating movement into and out of the upper and lower sheds, a pair of weft drawing needles supported for reciprocation at the opposite side of said loom for reciprocating movement into and out of the upper and lower sheds, and a pair of stationary weft thread supply sources supported at said one side of said loom for supplying a weft thread to each of said pair of weft inserting needles to be carried thereby to the medial portion of the upper and lower sheds and transferred to said weft drawing needles so that the weft threads are inserted as picks in the upper and lower sheds, the combination therewith of

a. a slide bearing block supported adjacent each side of said loom for guiding said pairs of needles along the front of said reed as said needles move in and out of the upper and lower sheds,

b. slide pads fixed on the inner end portions and on the sides of said needles adjacent said reed, said slide pads being formed of anti-friction material for engagement with said reed as said needles move in and out of the upper and lower sheds,

c. pressure pads carried by each of said slide bearing blocks and engaging the side of said needles opposite the side of said needles on which said slide pads are fixed,

d. resilient means carried by said slide bearing blocks and urging said pressure pads against said needles to resiliently maintain said slide pads of anti-friction material against said reed so that they bear against and slide with low friction against the front of said reed,

e. a pair of weft thread positioning pins supported between said slide block on said one side of said loom and the adjacent one edge of the fabric,

f. means operatively connecting said pair of weft thread positioning pins together for simultaneous operation,

g. weft thread positioning pin operating means for positioning the weft threads extending from the respective supply sources to said one edge of the fabric in the inner ends of said weft inserting needles as said weft inserting needles start their inward reciprocation,

h. a shear blade supported between said pair of weft thread positioning pins and the adjacent edge of the fabric,

i. shear blade operating means operable in timed relationship to operation of said weft thread positioning pins for positioning said shear blade to cut the threads between said one edge of the fabric and the inner ends of said weft inserting needles as they move inwardly and as said reed moves rearwardly from said beat-up position,

j. weft thread cutting means supported adjacent the other edge of the fabric and being operable to cut the wedt threads extending beyond said other edge of the fabric, and

k. a suction nozzle supported between said weft thread cutting means and said weft drawing needles when in withdrawn position, said suction nozzle being operable to remove the weft thread ends when cut by said weft thread cutting means.

3,916,957
TAPE DRIVE IN WEAVING MACHINES

Raymond Dewas, 120, Boulevard de Saint Quentin, Amiens, France

Filed Aug. 12, 1974, Ser. No. 496,907

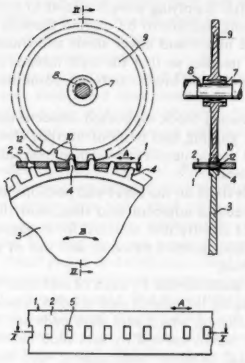
Claims priority, application Luxemburg, Aug. 13, 1973, 68217

Int. Cl.² D03D *47/00*

U.S. Cl. 139—123 **17 Claims**

1. In a weaving machine, a guide for a weft inserting control tape, comprising at least one inserter having a flexible strip with perforations, a driving wheel adapted to be rotated by a reciprotating movement and having teeth meshing with said perforations, whereby a cooperation zone is formed between the strip, and the wheel and an auxiliary idle wheel having means engaging an outer surface of said strip in said zone to

prevent a separation of the strip from said driving wheel, as well as meshing means carried upon the circumference of the



idle wheel to cause said driving wheel to impart a rotary movement to said idle wheel.

3,916,958

PROCESS AND APPARATUS FOR PRODUCING A BARBED SPIRAL

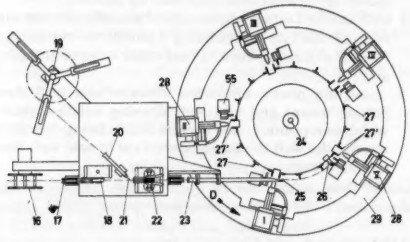
Siegfried Uhl, Augsburg, Germany, assignor to Keller & Knappich Augsburg, Zweigniederlassung der Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft, Augsburg, Germany

Filed Sept. 23, 1974, Ser. No. 508,133

Claims priority, application Germany, Sept. 28, 1973, 2348714

Int. Cl.² B21F *27/08*

U.S. Cl. 140—4 **14 Claims**



3. An apparatus for producing a barbed spiral from a flat metallic barbed strip having a series of barbs and a supporting wire comprising:

a first supply feed for feeding a supporting wire;

a second supply feed for feeding the flat metallic strip;

envelope rollers receiving the strip and the wire and embedding the wire into the flat metallic strip;

a reel at the output of the envelope rollers for winding the wire supported strip in convolutions which are juxtaposed in the longitudinal direction of the spiral; and

connecting means for coupling connecting members on every other barb of adjacent convolutions of the spiral so that the spiral is extendable in a longitudinal direction in an accordion-like manner.

3,916,959

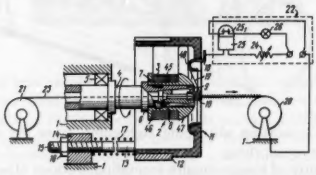
DEVICE FOR INITIAL COLLING OF FILAMENT ON FILAMENT CORE

Mikhail Alexeevish Konin, prospekt 50 let Oktyabrya, 24, kv. 46; Anatoly Ilich Alexeikin, prospekt 50 let Oktyabrya, 15, kv. 69; Petr Ivanovich Nikolaev, ulitsa Popova, 62, kv. 61; Viktor Fedorovich Kazakov, ulitsa Volodarskogo, 80, kv. 5, and Nikolai Stepanovich Alshin, ulitsa Svetotekhniki, 17, kv. 3, all of Saransk, U.S.S.R.

Filed May 2, 1974, Ser. No. 466,254

Int. Cl.² B21F *45/00*

U.S. Cl. 140—71.5 **3 Claims**



1. A device for initial coiling of a filament made of thin wire on a filament core, comprising:

a. a base;

b. a spool with said thin wire;

c. a hollow spindle;

d. said hollow spindle being cantilever-mounted on said base so as to be rotatable;

e. said spool being fixed on a free end of said hollow spindle;

f. a nozzle intended to let said core, pulled through said hollow spindle, pass therethrough;

g. said nozzle being housed in the hollow spindle near its end face;

h. a housing arranged coaxially with said spool and mounted on said base;

i. said housing being adapted to confine the size of a loop formed under the action of centrifugal forces of the wire unrolled from said spool to be coiled;

k. said housing being so mounted on said base as to enable it to move longitudinally relative to said spool;

l. a fixing means ensuring the position of a portion of the wire, fed to the core for coiling, at a predetermined angle;

m. said fixing means being fastened inside the housing on the bottom thereof.

3,916,960

CATALYST UNLOADER APPARATUS AND METHOD

Robert L. Thompson, Alvin, Tex., assignor to Browning-Ferris Industries, Inc.

Filed Apr. 26, 1974, Ser. No. 464,313

Int. Cl.² B65B *3/00, 1/00*

U.S. Cl. 141—1 **11 Claims**

9. A method for unloading non-packed, non-bridging and packed bridging flowable particle catalyst from an open end of a reactor tube secured by a tubesheet adjacent the open end of the tube, comprising the steps of:

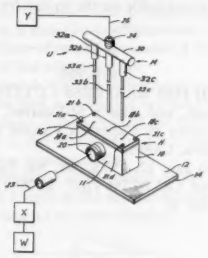
placing a head adjacent the open end of a catalyst filled reactor tube to be unloaded;

forming a pressure differential in the tube for effecting flow of catalyst outwardly therefrom, including:

establishing a reference pressure adjacent the head for removing non-packed, non-bridging catalyst; and,

discharging a fluid controlled stream of fluid within the tube to be unloaded to loosen bridging catalyst for effecting flow of loosened, bridging catalyst and fluid toward the

head for moving the fluid and loosened, bridging catalyst from the tube to be unloaded, and;



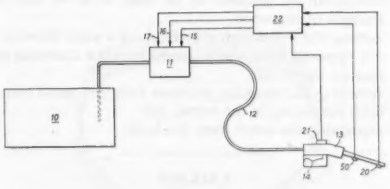
flowing the catalyst outwardly from the open end of the tube with the pressure differential to the head.

3,916,961

LIQUID DISPENSING APPARATUS

Lawrence Dilger, Fairways 46, Ridge Langley, South Croydon, Surrey, England

Filed Mar. 20, 1974, Ser. No. 452,957
Claims priority, application United Kingdom, Mar. 26, 1973, 14317/73
Int. Cl.[2] B65B *31/00*
U.S. Cl. 141—46 12 Claims



1. Control apparatus for a liquid dispensing system including flow regulating means and a delivery nozzle, comprising a first detector arranged on the nozzle to be unaffected by the normal liquid delivery through the nozzle but responsive to fluid surge against delivery from the nozzle, and control means operably connected to control said flow regulating means in response to the detection of a surge by the first detector, wherein said control means is electrically operated and comprises a bi-stable switch circuit connected to be triggered into a set condition on receipt of an electrical starting signal and to be triggered into a re-set condition on receipt of an electrical signal from said first detector on detection of a surge thereby, and connected to cause said flow regulating means to operate when in said set condition.

3,916,962

BAG SUPPORT AND SCOOP

Randolph Stolt, 165 Grant Ave., Portsmouth, N.H. 03801

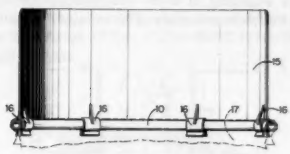
Filed Aug. 26, 1974, Ser. No. 500,652
Int. Cl.[2] B65B *1/04*
U.S. Cl. 141—108 8 Claims

1. A bag opening support and scoop combination comprising:

a. a hoop for supporting the opening of a plastic bag;

b. a first plurality of spring clips mating with a first portion of said hoop for clamping a first part of the lip of said bag therebetween; and,

c. a semirigid scoop integral with a second plurality of clips mating with a second portion of said hoop for clamping



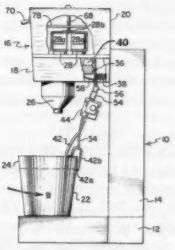
the remainder of said lip and for providing an entrance scoop to said bag.

3,916,963

AUTOMATIC DRINK DISPENSER

Lawrence D. McIntosh, Chicago, Ill., assignor to Rolar, Inc., Arlington Heights, Ill.

Filed June 13, 1974, Ser. No. 478,895
Int. Cl.[2] B65B *3/26*
U.S. Cl. 141—198 28 Claims



1. In combination with a soft drink dispenser of the type having a solenoid controlled dispensing valve for discharging liquid into a cup placed in a receiving position, a control unit comprising probe means for making contact with the liquid dispensed into a cup placed in said receiving position when said liquid reaches a predetermined level in said cup, first means actuated by said probe means upon movement of a cup into said receiving position for actuating said solenoid controlled dispensing valve of said dispenser to discharge liquid into said cup and second means actuated by the contact of said liquid in said cup with said probe means when said liquid reaches said predetermined level for actuating said solenoid controlled valve of said dispenser to shut off the discharge of liquid.

3,916,964

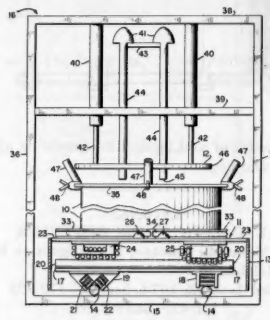
CONTAINER POSITIONING APPARATUS

Robert M. Elsworth, Loudonville, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Feb. 7, 1974, Ser. No. 440,441
Int. Cl.[2] B67C *3/34*
U.S. Cl. 141—283 12 Claims

1. A self-aligning platform structure which comprises a plurality of substantially horizontal parallel base rails affixed to the upper surface of a base member, an intermediate platform having bearing means therebeneath coacting with said base rails for supporting said intermediate platform for rectilinear movement along said base rails, a plurality of substantially horizontal parallel platform rails affixed to the top of said intermediate platform and longitudinally oriented substantially perpendicularly to the length of said base rails, a top platform for supporting a container and having bearing means therebeneath coacting with the platform rails for supporting

said top platform for rectilinear movement along said platform rails, whereby said top platform is supported for easy movement in any horizontal direction relative to said base rails, at least one locating device on the upper surface of said top platform for engaging at least one complementary locating element on the bottom surface of a container as said container



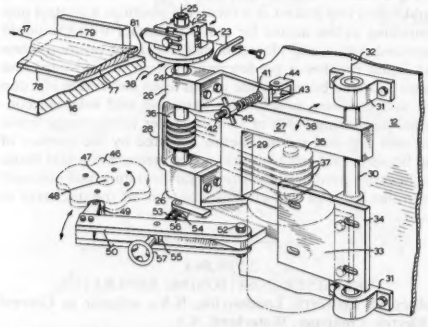
vertically approaches said platform, at least one of the locating means projecting from the supporting said surface, and at least one of said locating means having a sloping surface capable of exerting any necessary camming action during the engagement of said locating means to provide any necessary horizontal movement of said top platform for locating said container in predetermined registry on said top platform.

3,916,965

APPARATUS FOR EDGE-SHAPING BOARDS

William Earl Attridge, 44 Kennedy St., and Karl Franz Vogel, 101 Berczy St., both of Aurora, Ontario, Canada

Continuation of Ser. No. 288,264, Sept. 12, 1972, abandoned. This application Apr. 10, 1974, Ser. No. 459,512
Claims priority, application Canada, May 4, 1972, 141262
Int. Cl.[2] B27C *5/02*
U.S. Cl. 144—134 R **9 Claims**



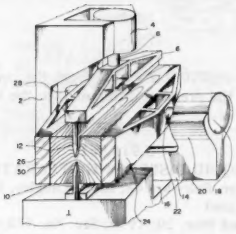
1. Apparatus for cutting a longitudinal edge of a board to an irregular shape, comprising a body, a bed on the body and on which the board moves in passing through the apparatus in a corresponding longitudinal direction, an edge cutter mounted by the body for to and fro movement in a direction transverse to the said longitudinal direction to engage the cutter with an edge of a board on the bed and to shape the engaged edge thereof, and cutter moving means mounted by the body for moving the edge cutter in an irregular motion in the said transverse direction to cut the engaged edge to the required irregular shape, the cutter moving means comprising a motor, cam means constituted by a cam having an irregular profile and a cooperating cam follower connected between the motor and the edge cutter whereby the edge cutter is driven by the motor through the cam means for the required irregular movement, and a variable speed gear connected between the motor and the cam means for varying the speed at which the cam means is driven by the motor and thereby varying the effect of the irregular cam profile on the to and fro movement of the edge cutter.

3,916,966

METHOD FOR KERFLESS CUTTING WOOD

John S. Johnston, and Andre St-Laurent, both of Ottawa, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Jan. 22, 1975, Ser. No. 542,912
Int. Cl.[2] B27M *1/08;* **B27C** *1/00*
U.S. Cl. 144—309 D **7 Claims**



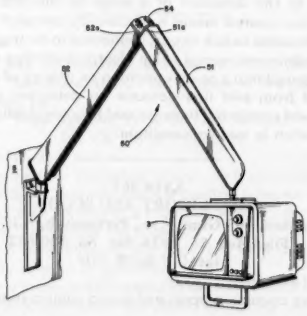
1. A method for kerfless cutting wood, comprising:
a. applying a clamping pressure to substantially the entire surfaces of two opposed sides of the wood so that it is compressively stressed to at least 25% of the yield strength of the wood,
b. cutting the wood with a knife along a path between the two opposed sides, while maintaining the clamping pressure on the wood,
c. removing the clamping pressure from the wood with the knife remaining in the wood, and
d. separating the wood from the knife.

3,916,967

COVER

Neil K. Carlisle, Chelmsford, and James L. Pettee, Winchester, both of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Mar. 26, 1975, Ser. No. 562,267
Int. Cl.[2] B65D *65/08*
U.S. Cl. 150—52 R **12 Claims**



1. A cover comprising:
a first, generally-rectangular, generally-flat, flexible, elongated section of material having a first end portion and a

second, opposed end portion, said second end portion having a cup-like configuration;

a second, generally-rectangular, generally-flat, flexible, elongated section of material having a first end portion and a second, opposed end portion, said second end portion having a cup-like configuration;

the first end portion of one of the sections overlying the first end portion of the other section;

a flat sheet of stretch material interconnecting the first end portions of the first and second sections;

first means disposed at the edges of the first section parallel to the length of the first section for joining the edges of the first section together; and

second means disposed at the edges of the second section parallel to the length of the second section for joining the edges of the second section together.

3,916,968
VEHICLE TIRES

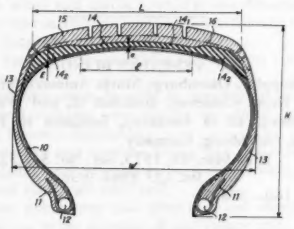
Yves Masson, Paris, France, assignor to Pneumatiques, Caoutchouc Manufacture et Plastiques Kleber-Colombes, Paris, France

Filed Jan. 28, 1974, Ser. No. 436,864

Claims priority, application France, Jan. 29, 1973, 73.03118

Int. Cl. B60c *9/12*

U.S. Cl. 152—353 **9 Claims**



1. A low-profile vehicle tire whose cross-sectional proportions of height to width do not exceed 0.8 to 1, comprising a carcass having side-walls and a crown, a tread and an inextensible reinforcing breaker positioned between said carcass crown and said tread, said breaker extending transversely for a width at least equal to the width of said tread and having a shallow central section and two deep circumferentially continuous lateral sections, said shallow central section of said breaker having a width between half and two-thirds of the width of said tread, and a depth which is substantially uniform and is not greater than three times the depth of said carcass crown, and wherein at least said lateral sections of said breaker are made of an anisotropic rubbery mixture having a very high modulus of elasticity in the circumferential direction of said tire, said modulus of elasticity being greater than 15 kg/cm² at 10% extension, and being at least three times greater than the modulus of elasticity in the other, transverse and radial directions of the tire, the depth of said lateral sections of said breaker being two to three times the depth of said central section of said breaker.

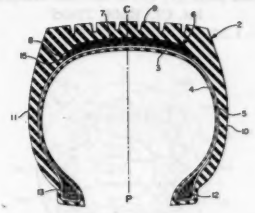
3,916,969
METHOD OF BUILDING A RADIAL TIRE

Melvin Auerbach, Akron, and Robert M. Pierson, Hudson, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 26, 1973, Ser. No. 410,149

Int. Cl.² B29H *17/14, 17/26;* **B60C** *9/14, 9/18*

U.S. Cl. 152—354 **24 Claims**



1. A method of building a tire of two adjacent layers of rubberized tire cords wherein during molding of the tire it is important that the cord angle of the cords of at least one of the layers change, characterized by placing a third layer of material between the two layers prior to molding the tire into a toroidal configuration for vulcanization, the material comprising a thermoelastic block polymer from the group of ABA and ABC block polymers in which A represents a polymer derived from monovinyl aromatic monomers, C represents a polar polymer derived from vinyl pyridine, vinyl quinoline, acrylic, vinyl nitrile, vinyl furan and vinyl carbazole monomers, B represents a rubbery polymer derived from a conjugated diolefin monomer, and in which A represents from 15 to 60 percent by weight of the total ABA polymer, and in which A plus C represents 15 to 60 percent by weight of the total ABC polymer, and in which the molecular weights of the ABA and ABC block polymers are each in the range of from 50,000 to 150,000.

3,916,970
DEFORMABLE BEAD RETAINING MEMBERS

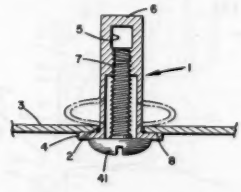
Geoffrey Lloyd Owens, Sutton Coldfield, England, assignor to Dunlop Limited, London, England

Filed Feb. 16, 1973, Ser. No. 333,381

Claims priority, application United Kingdom, Feb. 22, 1972, 08024/72

Int. Cl.² B60C *5/16, 7/26, 15/02, 29/00*

U.S. Cl. 152—379.1 **13 Claims**



1. A wheel rim and tire assembly comprising a pneumatic tire mounted on an associated rim and having at least one tire bead retaining member inserted from the exposed side of the rim through an aperture provided in the rim axially inboard of an adjacent the tire bead, the said member having a flange at the outer side of the rim relative to the cavity between the rim and tire and an expanded portion at the inner side of the rim relative to the cavity between rim and tire, the flange and expanded portion securing the member to the rim and the

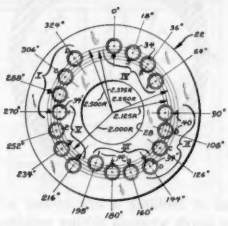
expanded portion engaging the associated tire bead to prevent axially inward displacement thereof.

3,916,971

ADAPTOR FOR TIRE CHANGING STANDS

David M. Carpenter, Nashville, and Stephen F. Howard, Antioch, both of Tenn., assignors to The Coats Company, Inc., LaVergne, Tenn.

Filed June 17, 1974, Ser. No. 480,317
Int. Cl.² B60C *25/06*
U.S. Cl. 157—1.24 **5 Claims**



1. An adaptor for use with tire changing machines comprising,

a plate;

means on said plate whereby said plate may be secured to a tire changing stand;

a plurality of at least four groups of plural bores in said plate, the bores within each group being at differing radii with respect to a predetermined point on said plate and each bore of a group being at the same radii as a corresponding bore in at least one of the other groups, sets of said groups being located at different angular positions about said point with the angular spacing between the corresponding bores within the groups of each set being different from the angular spacing between the corresponding bores within the groups of each other set, at least some of said bores being common to two of said groups; and

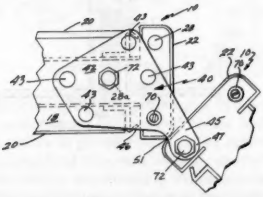
a plurality of at least two lugs removably received in different ones of said bores.

3,916,972

PARTITION SYSTEM

Frank S. Breiner, Kentwood, Mich., assignor to Steelcase Inc., Grand Rapids, Mich.

Filed Sept. 28, 1973, Ser. No. 401,821
Int. Cl.² A47G *5/00*
U.S. Cl. 160—135 **15 Claims**



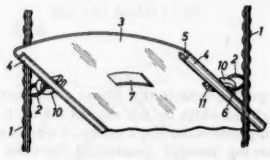
1. A partition system comprising: first and second partitions and a link for joining said partitions, each of said partitions having fastening means to facilitate fastening of said partition to said link; said link having a body and a leg projecting from said body; a first set of at least three connectors located in said body, a first two connectors of said first set for cooperating with said first partition fastening means and a third connector for cooperating with said second partition fastening means for joining said first and second partitions together in alignment with one another; said link having a separate second set of at least three different connectors, a first and second connector for cooperating with said first partition fastening means and a third connector for cooperating with said second partition fastening means for joining said first and second partitions together in an angular relationship with respect to each other; said first set of connectors being located so as to be in alignment with said first partition when said link is joined to said first partition by said first two connectors of said first set of connectors, whereby said second partition will be in alignment with said first partition when joined to said third connector of said first set of connectors; at least said third connector of said second set of connectors being located in said leg; said leg and said first set of connectors being oriented with respect to each other such that said leg is in alignment with said first partition when said link is joined to said first partition by said first two connectors of said first set of connectors; said leg being oriented with respect to said first two connectors of said second set of connectors such that said leg projects generally laterally out of alignment with respect to said first partition when said first two connectors of said second set of connectors is used to join said link to said first partition, said second set third connector cooperating with said second partition fastening means to define a pivotal connection therebetween such that said second partition can be pivoted with respect to said first partition when joined thereto through said second set of connectors, whereby when said second partition is joined to said second set third connector in an angular relationship, the inside corner defined by said first and second partitions will be relatively smooth flowing and less staggered than would be the case if said second set third connector were in alignment with said first partition when said link is joined to said first partition by said first two connectors of said second set of connectors.

3,916,973

VENETIAN BLIND

Emil Schuppler, Oldenburg; Mario Ammazzalorso, Wardenburg; Heiko Coldewey, Jeddeloh II, and Wilfried Horst, Oldenburg, all of Germany, assignors to Firma Justin Huppe, Oldenburg, Germany

Filed Mar. 19, 1973, Ser. No. 342,332
Int. Cl.² E06B *9/38*
U.S. Cl. 160—178 R **10 Claims**

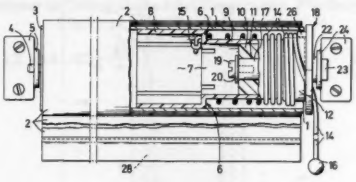


1. A venetian blind comprising a plurality of slats, each having on each outer edge a turned under reentrant flange having a free edge; pairs of supporting cords for supporting and adjusting the inclination of the slats, the cords of each pair being disposed on opposite sides of the slats; and separate securing devices for attaching the slats to the supporting cords, there being one securing area at said outer edge for each securing device, the securing devices being receivable between the slats and the flanges and having locking parts adapted to engage both the outer edge securing areas and the free edge of a respective slat to hold the securing devices in position on the slats.

3,916,974
ROLLER DEVICE FOR A FLEXIBLE SHEET

Sigfrid Emanuel Lidin, Gullmarsvagen 2, 121 41 Johanneshov, Sweden

Filed Feb. 14, 1974, Ser. No. 442,512
Int. Cl.² A47G 5/00; E06B 3/00
U.S. Cl. 160—319 11 Claims



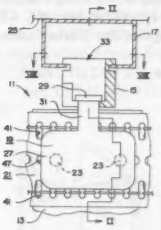
1. A roller device for a flexible sheet comprising
a. a rotary unit including
1. means forming a cylindrical winding core for the flexible sheet, and
2. means forming a drum co-axial with and connected to one end portion of said core, said drum having an inner end, a free outer end and a diameter smaller than that of said core,
b. a string having its one end attached to said rotary unit adjacent the inner end of said drum and a portion of its length available for manual control, said string being adapted to be wound up around said drum in a helical fashion, when said unit is rotated in one direction, and to be unwound therefrom, when pulled to thereby cause said unit to rotate in the opposite direction,
c. means for rotatably mounting said unit on a supporting structure and
d. string guiding means forming an opening for the string to pass when entering and leaving the drum, said string guiding means comprising
1. a plate-like end member facing said free outer end of the drum and extending, at least partially, radially beyond said drum end, and
2. means preventing said plate-like end member from partaking in the rotation of said rotary unit,
wherein said string guiding means further comprise means restricting and locating said opening for the string to pass to a region adjacent the outer end of the drum and, hence, axially remote from the inner end of the drum,
wherein said plate-like end member is operative to cause the loops or coils successively formed by the string, when the latter is entering the drum, to move axially inwards over the drum towards the inner end thereof, and
wherein said means for rotatably mounting said rotary unit and said means preventing rotation of said plate-like end member extend axially outside said rotary unit
whereby the flexible sheet may extend a considerable distance axially beyond said inner end of the drum and, when wound up, enclose a considerable part of the total length of the drum without in any way interfering with the string.

3,916,975
DRAPERY SUSPENSION MEANS

Jack M. Lawson, P.O. Box 17367, Memphis, Tenn. 38117

Filed June 27, 1974, Ser. No. 483,548
Int. Cl.² A47H 1/00
U.S. Cl. 160—330 11 Claims

1. Drapery suspension means for connecting a drapery to a drapery carrier slidably mounted to a drapery supporting rod, said drapery suspension means comprising pendant means attaching to the drapery carrier, said pendant means including means coacting with the drapery carrier to restrict the rotation

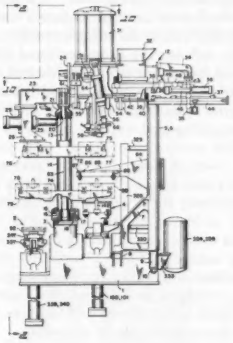


of said means and connecting means connecting said pendant means to the drapery.

3,916,976
PROCESS FOR PRODUCING FOUNDRY SAND MOLDS

Leon F. Miller, Rocky River; Henry J. Herbruggen, Westlake, and Robert G. Shields, Chagrin Falls, all of Ohio, assignors to The Sherwin-Williams Company, Cleveland, Ohio

Division of Ser. No. 131,528, April 5, 1971, Pat. No. 3,815,662, which is a division of Ser. No. 672,063, Oct. 2, 1967, Pat. No. 3,589,432. This application Jan. 3, 1974, Ser. No. 430,473
Int. Cl.² B22C 15/30
U.S. Cl. 164—37 11 Claims



1. A process for producing foundry sand molds comprising the steps of assembling cope and drag flasks with a pattern therebetween, placing the drag flask up and filling it with sand, preliminarily squeezing the sand therein, then turning the assembly over and filling the cope flask with sand, squeezing such sand in both the cope and drag flasks, vertically separating the cope and drag flasks, and then laterally indexing such flasks vertically separated for coring and closing.

3,916,977
METHOD AND AN APPARATUS FOR BUILDING UP SHEET MATERIAL FROM WELDING METAL

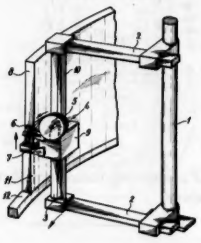
Rudolf G. Bakker, Oud Beijerland, and Hans Klumpes, Maassluis, both of Netherlands, assignors to De Rotterdamsche Droogok Maatschappij B.V., Roterdam, Netherlands

Filed Jan. 10, 1974, Ser. No. 432,323

Claims priority, application Netherlands, Jan. 12, 1973, 7309521

Int. Cl.² B22D 27/02

U.S. Cl. 164—52 **4 Claims**



1. A method of making sheet material from a plurality of vertically extending, contiguous beads comprising the steps of, providing a molding shoe having side walls partially defining the cross-sectional shape of a bead to be formed, positioning said molding shoe adjacent the vertical side edge of a previously formed bead with said mold shoe side walls and said bead vertical edge completely defining the cross-sectional shape of a bead to be formed, supplying a molten weld metal to said shoe, moving said molding shoe vertically upward along said bead vertical edge while performing said metal supplying step to form a successive, vertically extending bead in fused relationship with said previously formed bead and successively performing said bead forming steps to form sheet material of a selected length from a plurality of said beads.

4. An apparatus for making sheet material from a plurality of vertically extending, contiguous beads comprising, in combination, welding means including a molding shoe having side walls partially defining the cross-sectional shape of a bead to be formed and means for supplying molten welding metal to said shoe, a vertically extending shaft, at least one horizontally extending girder rotatably mounted at one end on said shaft, means for mounting said welding means on the other end of said girder for vertical movement with said molding shoe adjacent the vertical side edge of a previously formed bead with said mold shoe side walls and said bead vertical side edge completely defining the cross-sectional shape of a bead to be formed, said molten metal being supplied by said supplying means to said molding shoe during the vertical movement of said welding means to form a vertically extending bead in fused relationship with said previously formed bead and said girder being arranged for intermittent, indexing rotation to successively form a plurality of said beads in contiguous, fused relationship forming said sheet material.

3,916,978
PROCESS FOR MAKING METAL INGOTS

Erwin Plockinger, and Gert Kuhnelt, both of Kapfenberg, Austria, assignors to Vereinigte Edelstahlwerke AG., Vienna, Austria

Division of Ser. No. 847,891, Aug. 6, 1969, Pat. No. 3,820,587. This application Nov. 9, 1973, Ser. No. 414,393

Claims priority, application Austria, Jan. 29, 1970, 530/70

Int. Cl.² B22D 27/02

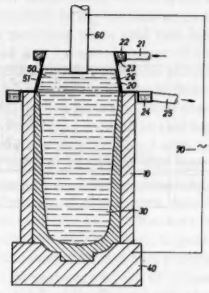
U.S. Cl. 164—52 **6 Claims**

1. A process of making metal ingots in an ingot mold, which comprises

pouring molten metal in a lower portion of said mold,

pouring liquid slag into said mold on top of said body of molten metal within a slag confining wall,

supplying heating energy to said body of liquid slag at a rate corresponding to at least 120 kilowatt-hours per metric ton of metal in said mold,



contacting the outside of said slagconfining wall with a cooling fluid to cool said slag-confining wall sufficiently to maintain a layer of solid slag between said wall and said body of liquid slag

and causing said molten metal in said mold to solidify while maintaining the exterior wall surfaces of the walls of said mold opposite the interior wall surfaces of said mold which are contacted by said metal out of contact with cooling liquid.

3,916,979
METHOD FOR OBTAINING SPHEROIDAL GRAPHITE CASTINGS

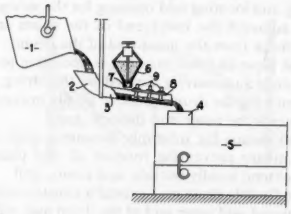
Michel Louis DeGois, and Daniel Christian Gouvenel, both of Pont-A-Mousson, France, assignors to Pont-A-Mousson S.A., Pont-A-Mousson, France

Filed May 8, 1973, Ser. No. 358,229

Claims priority, application France, May 10, 1972, 72.016809

Int. Cl.² B22D 27/20

U.S. Cl. 164—57 **4 Claims**



1. A method for obtaining castings of spheroidal graphite iron, by treatment of the iron with a powdered nodularizing agent, comprising filling a pouring ladle with liquid iron and pouring the iron from the ladle into an upstream end of a pouring trough which has a downstream end for pouring the liquid iron into a mould so that the iron flows in the trough in the form of a stream of iron, and incorporating the powdered nodularizing agent into the stream of iron in a region between the upstream end and downstream end of the trough and as near as possible to the downstream end of the trough, the flow of powdered nodularizing agent supplied to the liquid iron being adjusted in accordance with the flow of iron, and creat-

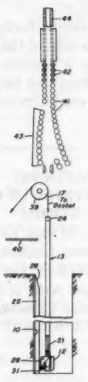
ing a turbulence in the stream of iron downstream of the region in which the nodularizing agent is incorporated.

3,916,980

METHOD AND MECHANISM FOR OPERATING THE LOCKING MEANS FOR CHILL PLATE OF A RIGID STARTER BAR

Thomas A. Cuscino, Scott Township, Allegheny County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Aug. 2, 1974, Ser. No. 494,244
Int. Cl.² B22D *11/08*
U.S. Cl. 164—82 4 Claims



1. In a combination which includes a rigid starter bar, a chill plate supported by said starter bar, a vertically movable hoist on which said bar rests and is supported thereby, and means for receiving said hoist and bar when lowered, said bar having locking means for said plate movable between released and locked positions, an improved mechanism for operating said locking means, said mechanism comprising cooperating means on said hoist and on said receiving means for releasing said locking means at a fixed location as said hoist and starter bar descend as a casting operation gets underway, whereby said starter bar remains on said hoist throughout the operating cycle and said starter bar is always at the same height when the chill plate is released.

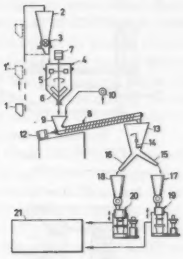
4. A method of operating the locking means for the chill plate of rigid starter bar, wherein the bar is carried in a vertically movable basket hoist when disconnected from the chill plate at the beginning of a cast, lowered for storage and lifted by said hoist to begin a cast, said method comprising actuating said locking means to release the chill plate by the action of cooperating means on said hoist and fixed means alongside said hoist when the starter bar descends at the beginning of a cast, maintaining the starter bar in contact with the hoist throughout the operating cycle, and performing the step of actuating the locking means with the starter bar always at the same height.

3,916,981

APPARATUS FOR PRODUCING SLEEVES OR SHEETS FOR FEEDER HEADS FORMED IN METAL CASTING

Masamitsu Miki, No. 25-15, 1-chrome, Nakahara, Mitaka, Tokyo, Japan

Continuation-in-part of Ser. No. 129,778, March 13, 1971, Pat. No. 3,776,992. This application Aug. 22, 1973, Ser. No. 390,407
Claims priority, application Japan, Sept. 7, 1970, 45-77948; Sept. 7, 1970, 45-77949
Int. Cl.² B22C *15/22*
U.S. Cl. 164—159 8 Claims



1. An apparatus for producing feeder head sheets for use in metal molding, which comprises:

a cotton-opening and mixing in the dry state granular, refractory materials and fibrous materials;

a kneader for kneading, in the moistened state, the materials cotton-opened and mixed by said cotton-opening mixer; and

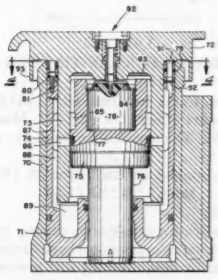
molding apparattus for molding, in a mold under air pressure, the materials kneaded by the kneader.

3,916,982

SOUND ATTENUATING IMPROVEMENTS FOR FOUNDRY MOLDING MACHINES

Warren A. Blower, Brecksville, and Harry R. Nara, Novelty, both of Ohio, assignors to The Sherwin-Williams Company, Cleveland, Ohio

Filed Dec. 12, 1972, Ser. No. 314,377
Int. Cl.² B22C *15/18, 15/14;* F01B *15/00;* F01L *21/02*
U.S. Cl. 164—206 26 Claims



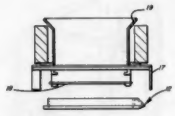
1. In a foundry jolt molding machine having a table adapted to support a sand-filled flask, a pneumatically operated jolt mechanism in said table including a vertically movable jolt ram, the improvement comprising exhaust system porting means for said jolt mechanism progressively enlarging in cross-sectional area towards a plurality of exhaust ports at atmosphere thereby substantially reducing the noise level of the machine, and an expansion chamber in said system be-

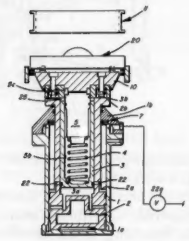
tween said jolt mechanism and said exhaust ports operative to reduce the pressure of the exhausting air, said expansion chamber being formed in part by a portion of the underside of said jolt ram.

3,916,983
MOLDING MACHINE

Edward D. Abraham, 6695 Fairview Road, Brecksville, Ohio 44141

Filed Jan. 2, 1974, Ser. No. 429,543
Int. Cl.[2] B22C *15/30*
U.S. Cl. 164—206 **14 Claims**





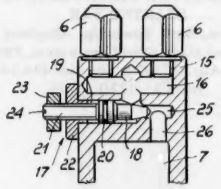
1. A molding machine comprising a table for supporting a mold pattern and a mold, a cylinder located beneath said table, a first piston located with said cylinder and movable vertically therein to a limit position in which surfaces of said cylinder and first piston are in contact, a second piston carried within said first piston and means interconnecting the second piston with the table and with said first piston so that on vertical movement of the first piston the second piston likewise moves vertically, a first fluid chamber located between said first and second pistons for effecting movement of said second piston relative to said first piston on the application of fluid pressure thereto, and a third piston located within said second piston and movable relative to said table to strike said table to effect jolting thereof.

3,916,984
COOLING DEVICE FOR CONTINUOUS CASTING MACHINES

Ilario Properzi, via Cossa 1, Milan, Italy (20100)

Continuation-in-part of Ser. No. 128,792, March 29, 1971, Pat. No. 3,800,852. This application June 21, 1973, Ser. No. 372,372
Claims priority, application Italy, June 28, 1972, 26354/72
Int. Cl.[2] B22D *11/06*
U.S. Cl. 164—278 **3 Claims**

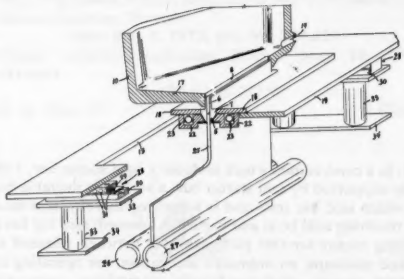
1. A cooling device for continuous casting machines of the type including a rotatable casting wheel having a peripheral groove and a metallic belt covering said groove along an arc portion thereof, comprising a substantially arcuate manifold for a cooling liquid arranged proximate to said casting wheel, means for supplying a cooling liquid to said manifold, a plurality of cooling liquid spraying nozzles supported by said manifold for cooling said casting wheel, passages in a wall of said manifold providing communication between said manifold and said nozzles, and valve means for controlling the flow of cooling liquid supplied to said nozzles, wherein said valve means are each arranged between said manifold and said nozzles and comprise needle valves each having a valve seat in said wall of said manifold extending substantially transverse to said nozzles and substantially parallel to the axis of the casting wheel and communicating with a corresponding one of said passages, and a valve member within said seat for individually controlling the flow of cooling liquid through said passages, each of said valve means further comprising a control means accessible from the side of the casting wheel and each of said passages including a portion extending substantially parallel to said casting wheel and having an opening aligned with said seat, said valve members being movable to control said opening.



3,916,985
APPARATUS FOR CONTINUOUS CASTING OF METAL STRIPS

Christopher John English, Mount Victoria, Hudson, Canada, assignor to Noranda Mines Limited, Toronto, Canada

Division of Ser. No. 207,843, Dec. 14, 1971, Pat. No. 3,797,555. This application Aug. 2, 1973, Ser. No. 385,037
Claims priority, application Canada, Sept. 30, 1971, 124136
Int. Cl. B22d *11/10*
U.S. Cl. 164—281 **11 Claims**

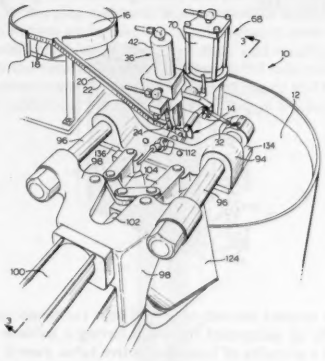


1. Apparatus for continuously casting metal strips which comprises: a tundish adapted to receive molten metal thereinto; means for heating said tundish to maintain said molten metal therein at a predetermined temperature; an open-ended mould made of non-wetting material, said mould projecting downwardly from said tundish and being directly connected with the bottom thereof in such a way that the top opening of said mould is in direct communication with the inside of the tundish; means for applying a cooling liquid directly onto each lateral wall of said mould at a controlled rate such as to produce a steep temperature gradient between an upper hot-top section of the mould and a lower cold section of said mould and so that said liquid will flow on said walls and will then directly impinge onto the metal strip emerging at the bottom end of the mould; and means for withdrawing said metal strip from the mould in a predetermined stop and start sequence.

3,916,986
LEAD WEIGHT-MAKING APPARATUS

Jarl A. Boberg, Scarborough, Canada, assignor to A. B. Machine Company, Scarborough, Canada

Filed Jan. 9, 1974, Ser. No. 431,893
Int. Cl.[2] B22D *17/24, 19/00*
U.S. Cl. 164—332 **14 Claims**



1. An apparatus for forming lead weights for the balancing of automobile wheels which comprises:

container means for holding a bath of molten lead,

a lead weight-forming mold cavity situated at a molding station,

liquid lead feed means for conveying molten lead from said bath to said mold cavity,

said mold cavity being defined by first and second plates situated in edge-abutting relationship and a block located in face-abutting relationship with said first and second plates, said block having a depression formed in the face thereof abutting said first and second plates,

said first and second plates being mounted for relative movement between a first stationary position in which the plates have said edge-abutting relationship and a second stationary position in which the plates are remote from said edge abutting relationship through an intermediate stationary position between said first and second stationary positions,

said block being mounted on a carrier member for reciprocal movement in a substantially horizontal plane between a first position wherein said block is located in said face-abutting relationship with said first and second plates and a second position horizontally remote from said first position,

the abutting edges of each of said first and second plates having a groove formed therein extending the depth of the plates, the grooves cooperating to define a lead conveying passage constituting part of said liquid lead feed means when said first and second plates are in said edge-abutting relationship,

weight retaining clip feed means to feed individual clips from a source thereof to a holding station, clip positioning means for moving individual clips from said holding station to said molding station,

clip supporting means on said first and second plates for supporting a clip at said molding station with part thereof extending into said mold cavity,

mechanical interconnecting means operably connecting said carrier member and said first and second plates for phased movement of said carrier member and said first and second plates between said first and second positions thereof for locating said carrier member at its first position when said first and second plates are located in their first position and at its second position when said first and second plates are located in their second position,

said mechanical interconnecting means comprising first and second elongate cam track elements associated with one of said carrier member and said first and second plates, first and second cam follower elements mounted respectively on the other of said carrier member and said first and second plates and each extending into engagement with one of said cam track elements for control of the position of said first and second plates relative to each other according to the positioning of said cam follower elements along the length of said cam track elements,

each of said cam track elements having first and second track portions in which the respective cam follower element moves to cause displacement of said first and second plates relative to each other during predetermined phases of movement of said carrier member between said first and second positions and an intermediate track portion between said first and second track portions to cause holding of said first and second plates at said intermediate stationary position thereof during the phase of movement of said carrier member intermediate said predetermined phases of movement thereof,

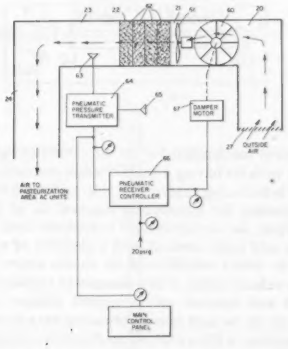
said mechanical interconnection being arranged to position said first and second plates to support a clip at said molding station at both said first and intermediate positions thereof but not at said second position thereof, and

knife means movable between a first inactive position and a second position wherein said knife means extends over the orifice to said lead conveying passage, whereby any solidified lead in said passageway may be detached from a lead weight formed in said mold cavity.

3,916,987
PASTEURIZATION ATMOSPHERE CONTROL SYSTEM

Joseph A. Giansante, Pottstown, Pa., assignor to Joseph A. Giansante, Pottstown, Pa.

Division of Ser. No. 314,449, Dec. 12, 1972, Pat. No. 3,820,278. This application Mar. 25, 1974, Ser. No. 454,461
The portion of the term of this patent subsequent to June 28, 1991, has been disclaimed.
Int. Cl.[2] F25B *29/00*
U.S. Cl. 165—16 **12 Claims**



1. A system for environmental control in a closed chamber for the pasteurization of soil or compost or a mixture thereof for the growing of mushrooms and the like, said system comprising:

A. means for supplying to said chamber outdoor air at a constant pressure;

B. means for venting at least a portion of the return air from said chamber to the atmosphere,

C. means for re-supplying to said chamber at least a portion of the return air from said chamber,

D. damper means for proportionally controlling the quantity of return air from said chamber which is recirculated to said chamber, the quantity of return air vented to said atmosphere, and the quantity of outdoor air supplied to said chamber,

E. means for collecting air from distributed points within said chamber and removing it therefrom, returning it to said vent air and recirculation air proportional controlling means,

F. means for introducing the portion of said return air re-supplied to said chamber and the quantity of outdoor air supplied to said chamber into said chamber at distributed points within said chamber,

G. automatic means for conditioning said air introduced into said chamber, said automatic conditioning means comprising:

i. means, for heating and cooling air introduced into said chamber, said heating means comprising means for introducing both high pressure steam and low pressure steam into said air,

ii. means for sensing the temperature of said air collected and returned from said chamber,

iii. control means associated with said temperature sensing means for actuating said heating means in response to a signal that said temperature is below a first pre-set limit and for actuating said cooling means in response to a signal that said temperature is above a second pre-set limit.

3,916,988

CONTROL MECHANISM FOR AN AIR-CONDITIONED DEVICE IN AUTOMOTIVE VEHICLES

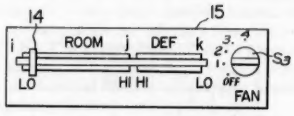
Tamotsu Matsuda, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Japan

Filed May 1, 1974, Ser. No. 465,761

Claims priority, application Japan, May 14, 1973, 48-53438

Int. Cl. B60h *3/04*

U.S. Cl. 165—42 **2 Claims**



2. A control mechanism for an air conditioning device in automotive vehicles having a main conduit connected to a first conduit for introducing external air into said main conduit and a second conduit for introducing internal air of the vehicle cabin thereinto, an air blower, an evaporator and air heater, arranged in said main conduit, and a plurality of conditioned air outlets to direct conditioned air to the upper and lower parts of the vehicle cabin, a first damper to regulate inlet ratio of external and internal air, a second damper to control amount of air to be sent into a reheating area in the vicinity of said air heater, a third damper to distribute conditioned air into said upper and lower outlets, and a fourth damper to control amount of air to be sent into a defroster outlet, wherein temperature, and blowing quantity of the conditioned air to each said outlets are adjusted by controlling of at least one of said evaporator said and air heater, and said dampers with a single controlling lever integrally formed with a controlling cam mechanism, said cam mechanism having means to operate said evaporator, said air heater and said dampers in an interrelated manner so as to constantly obtain and supply the optimum conditioned air adapted to the desired conditions by said interrelated factors to be controlled.

3,916,989

HEAT EXCHANGER

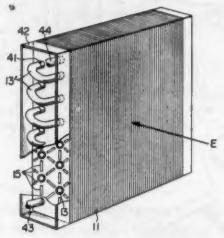
Fumio Harada; Takehiko Yanagida, both of Shimizu; Kunio Fujie, Tokyo, and Hajime Futawatari, Shimizu, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 26, 1974, Ser. No. 500,683

Claims priority, application Japan, Sept. 3, 1973, 48-98277

Int. Cl.² F28F *1/16*

U.S. Cl. 165—151 **9 Claims**



1. In a crossed fin-and-tube type heat exchanger including a plurality of juxtaposed fins each having a suitable surface area and a plurality of heat conductive tubes passed through and securely fixed to said juxtaposed fins such that a first heat exhanging medium in said tubes and a second heat exchanging medium passing between the fins will perform heat exchange through said heat conductive tubes and said fins, the improvement comprising a plurality of louvers defining slits formed in said fins to extend substantially raadially around said heat conductive tubes and transversely to said second heat exchange medium passing between the fins, each of said plurality of louvers being formed from slotted and raised-up portions of said fins, each of said raised-up portions having upright walls longitudinally opposed to each other and a ridge wall continuous to said upright walls therebetween, said ridge wall being formed substantially parallel to said juxtaposed fins and positioned in a space between said juxtaposed fins.

3,916,990

GAS TURBINE REGENERATOR

Anthony Ruhe, Fonthill; Robert R. Steel, and John W. Varney, both of Saint Catharines, Canada, assignors to Foster Wheeler Corporation, Livingston, N.J.

Continuation-in-part of Ser. No. 445,521, Feb. 25, 1974, abandoned. This application July 3, 1974, Ser. No. 485,643

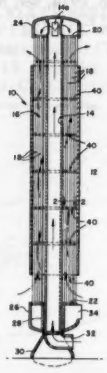
Int. Cl.² F28G *9/02*

U.S. Cl. 165—158 **11 Claims**

1. A gas turbine regenerator through which the exhaust gasses of a gas turbine are adapted to pass in heat exchange relation with combustion air of the gas turbine for injecting cooling fluid into; and heating, the combustion air enteringing said gas turbine comprising:

a conduit having an inlet for receiving the combustion air and an outlet for discharging same, a tube sheet connected to and supported by said conduit, a header connected to said tube sheet, a plurality of tubes extending parallel to said conduit, one end of each of said tubes being supported by said tube sheet in communication with said header, whereby said header reverses the fluid flow from said conduit and passes said combustion air into said tubes, an additional tube sheet supporting the other ends of said tubes, a sleeve connected at one end to the conduit close to the inlet thereof and to said additional tube sheet at a free end thereof spaced from said conduit inlet and surrounding a portion of said conduit with the inner wall of said sleeve extending in a spaced relation to the outer surface of said conduit to permit relative movement therebetween, an additional header connected to said additional tube sheet and to said sleeve

at the end thereof close to the conduit inlet, said additional header adapted to receive said combustion air from said other ends of said tubes and discharge same from the outlet formed therethrough, and a housing having a circular cross-section located coaxially with respect to said conduit the tubes enclosed in an annular space defined between said housing and conduit having an inlet for receiving the exhaust gases of said gas turbine and an inlet for discharging said same in a counterflow relation to said combustion air in said tubes, said exhaust gases being at a relatively high temperature than said combustion air with the resultant thermal expansion of said tubes being accommodated by movement of said sleeve and therefore said additional tube sheet and additional header relative



to said conduit; at least one support unit for supporting tubes in a spaced relation within the housing, said unit comprising a plurality of interconnected strips formed into a grid pattern defining a first series of openings for respectively receiving said tubes said openings spaced uniformly about the exterior surface of the tubes forming a spaced sleeve thereabout, and a second series of openings for permitting the passage of the combustion air therethrough, said strips being interlaced with at least one side being slotted to facilitate said interconnection, and a fluid injection means for injecting of cooling fluid into the conduit near the inlet for mixing with said combustion air, the heat exchange between the combustion air gases being sufficient to vaporize the cooling fluid.

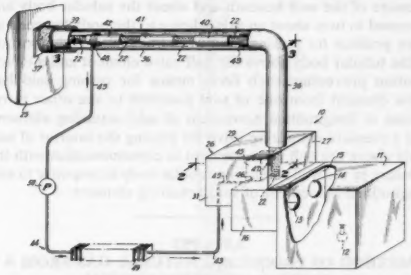
3,916,991

HEATING SYSTEM

George S. Trump, 6100 Madison St., West New York, N.J. 07093

Filed Apr. 5, 1974, Ser. No. 458,105
Int. Cl.[2] F28D *15/00*
U.S. Cl. 165—163 **10 Claims**

1. A heating system for use with a primary source of heat such as hot gas generated by a furnace, or the like, comprising: first conduit means communicating with said primary source of heat for conducting exhaust gas generated by said primary source of heat toward an exhaust direction; second conduit means disposed proximate portions of said first conduit means for conducting a fluid from said points of proximity to a point substantially remote therefrom; means for causing predetermined quantities of said exhaust gas to escape from said first conduit means and to contact said second conduit means, thereby permitting an exchange of heat to occur as between said exhaust gas and said fluid; and third conduit means housing portions of said first and second conduit means for conveying spaced exhaust gas toward said exhaust direction, said first conduit means comprising a first conduit member formed with perforations through portions thereof and communicating at a first end thereof to an outlet port of a furnace, an opposite second end of said first conduit member communicating with an exhaust flue, said second conduit means comprising a second conduit member disposed in substantially coiled configuration about and proximate said perforations of said first conduit member, and said heating system further comprising



at least one sleeve member disposed intermediate said perforations and said second conduit member, said sleeve member being in contact with said second conduit member such that heat energy carried by said exhaust gas escaping through said perforations is capable of reaching said second conduit member and said fluid therewithin by both convection and conduction through said sleeve, said perforations comprising said means for causing predetermined quantities of said exhaust gas to escape.

3,916,992

REMOTELY OPERATED WELL SAFETY VALVES

George I. Boyadjieff, Woodland Hills, and Ben A. Otsap, Encino, both of Calif., assignors to Varco International, Inc., Orange, Calif.

Division of Ser. No. 252,808, May 12, 1972, Pat. No. 3,853,175, which is a continuation-in-part of Ser. No. 203,142, Nov. 30, 1971, abandoned. This application Aug. 22, 1974, Ser. No. 499,504
Int. Cl.[2] E21B *41/00*
U.S. Cl. 166—224 A **9 Claims**

7. Well safety apparatus comprising a safety valve adapted to be lowered into a well and actuable between an open condition for passing production fluid upwardly through said well

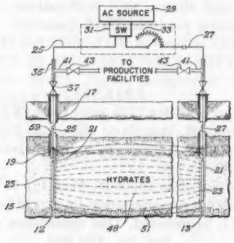
and a closed condition shutting off such fluid flow, and an elongated actuating element to extend upwardly from said valve through the well toward the surface of the earth and adapted to be moved longitudinally from its upper end and acting in response to said longitudinal movement to cause actuation of said valve between said two conditions thereof, said safety valve including a hollow tubular body, a ball valve element communicating at its upper side with a portion of the interior of said tubular body and at its underside with the pressure of the well beneath and about the tubular body and mounted to turn about an axis relative to the body between an open position for passing fluid from the well into the portion of the tubular body above the ball valve element and a closed position preventing such flow, means for turning said ball valve element from one of said positions to the other in response to longitudinal movement of said actuating element, and a pressure equalizing valve for placing the interior of said body above the ball valve element in communication with the pressure of the well about said tubular body in response to said longitudinal movement of said actuating element.

3,916,993

METHOD OF PRODUCING NATURAL GAS FROM A SUBTERRANEAN FORMATION

Marvin LaVerne Katz, Dallas, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed June 24, 1974, Ser. No. 482,074
Int. Cl.[2] E21B *43/24*
U.S. Cl. 166—248 **5 Claims**



1. A method of producing gas from at least one subterranean formation comprising the steps of:

a. drilling at least two spaced apart wells from the surface of the earth into a subterranean formation that contains at least some of the gas in the form of hydrate;

b. melting said hydrate in said subterranean formation to free natural gas in situ; said melting of said hydrate including the step of heating said subterranean formation and said hydrate; said heating being effected by electrical conduction comprising passing from one of said wells to another of said wells an electrical current of sufficient magnitude to heat said formation; and

c. producing gas to the earth's surface.

3,916,994

SECONDARY RECOVERY METHOD

Jim Maddox, Jr.; Jack F. Tate, and Russell D. Shupe, all of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 20, 1974, Ser. No. 534,968
Int. Cl.[2] E21B *43/22, 43/27*
U.S. Cl. 166—271 **12 Claims**

1. A method for the recovery of hydrocarbons from a hydrocarbon-bearing formation containing acid-soluble components having at least one injection well and at least one production well penetrating the said formation and in fluid communication, which comprises displacing through the formation an aqueous acidic solution of 0.5 percent to 28 percent by weight of a non-oxidizing mineral acid and from about 0.005 percent to about 2 percent by weight of a compound therein, and recovering hydrocarbons through the production well, said compound being a sulfonated, ethoxylated compound having the general formula:

$$R(OCH_2CH_2)_nSO_3^-A^+$$

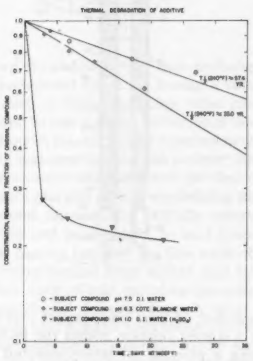
wherein R is alkaryl, containing from about 6 to about 18 carbon atoms in the alkyl portion thereof, n is a number from one to about 10, including fractions, and A^+ is a monovalent cation selected from the group sodium, potassium, and ammonium, including mixtures.

3,916,995

SECONDARY RECOVERY METHOD

Russell D. Shupe; Jim Maddox, Jr., and Jack F. Tate, all of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 20, 1974, Ser. No. 534,970
Int. Cl.[2] E21B *43/22, 43/27*
U.S. Cl. 166—271 **11 Claims**



1. A method for the recovery of hydrocarbons from a hydrocarbon-bearing formation containing acid-soluble components having at least one injection well and at least one production well penetrating the said formation and in fluid communication, which comprises displacing through the formation a composition comprising an aqueous, acidic solution containing from about 0.01 percent to about 5 percent by weight of carbon dioxide and from about 0.005 percent to about 2 percent by weight of a compound therein, said compound being a water-soluble sulfonated, ethoxylated compound having the general formula

$$R(OCH_2CH_2)_nSO_3^-A^+$$

wherein R is an aliphatic hydrocarbon group containing from about 8 to about 20 carbon atoms, n is a number from one to about ten including fractions, and A^+ is a monovalent cation selected from the group consisting of sodium, potassium, and ammonium, including mixtures.

3,916,996

SECONDARY RECOVERY METHOD

Russell D. Shupe; Jim Maddox, Jr., and Jack F. Tate, all of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 20, 1974, Ser. No. 534,981
Int. Cl.[2] E21B *43/22, 43/27*
U.S. Cl. 166—271 **9 Claims**

1. A method for the recovery of hydrocarbons from a hydrocarbon-bearing formation containing acid-soluble components having at least one injection well and at least one production well penetrating the said formation and in fluid communication, which comprises displacing through the forma-

tion a composition comprising an aqueous acidic solution containing from about 0.01 percent to about 5 percent by weight of carbon dioxide and from about 0.005 percent to about 2 percent by weight of a compound therein, said compound being a water-soluble sulfonated, ethoxylated compound having the general formula:

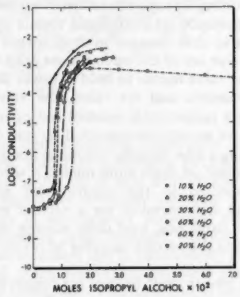
$$R(OCH_2CH_2)_nSO_3^-A^+$$

wherein R is alkaryl containing from about 6 to 18 carbon atoms in the alkyl portion thereof, n is a number from one to about 10 including fractions, and A^+ is a monovalent cation selected from the group sodium, potassium, and ammonium, including mixtures.

3,916,997
OIL RECOVERY WITH HIGH CONDUCTIVITY MICELLAR SYSTEMS

Larry J. Douglas, and Charles B. Wenger, both of Denver, Colo., assignors to Marathon Oil Company, Findlay, Ohio

Filed Sept. 13, 1973, Ser. No. 397,026
Int. Cl. E21b *43/16*
U.S. Cl. 166—275 **11 Claims**



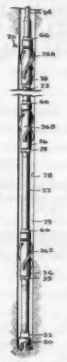
1. In a process for the secondary-type recovery of petroleum by injection of micellar systems into subterranean petroleum-bearing reservoirs, the improvement comprising utilizing as said micellar systems oil-external compositions having electrical conductivities of at least about 5×10^{-5} ohm^{-1} centimeter^{-1}.

3,916,998
DRILLING STABILIZER AND METHOD

Samuel L. Bass, Jr., and Herman J. Schellstede, both of New Iberia, La., assignors to Samuel L. Bass, Jr., New Iberia, La.

Filed Nov. 5, 1974, Ser. No. 521,055
Int. Cl.² E21B *31/00, 17/10*
U.S. Cl. 166—301 **10 Claims**

1. A drill collar stabilizer comprising rigid main sleeve means, an axial passageway extending the entire length of said rigid main sleeve means and including an inwardly extending fixed abutment means medially of said passageway the innermost extent of which abutment means defines an opening of sufficient size to permit said sleeve to be slidably received over a drill collar for axial movement along the drill collar, radially extending flange means extending outwardly of said sleeve means, clamping means positioned internally of said rigid main sleeve means adjacent said fixed abutment means and selectively operable for fixedly clamping said rigid main sleeve means to a collar over which said rigid main sleeve means is positioned and clamping actuator means mounted in said rigid main sleeve means for movement toward said fixed abutment

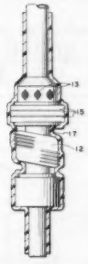


means while engaging said clamping means for actuating said clamping means.

3,916,999
RETENTION SLEEVE FOR WELL TOOLS AND METHOD OF USE THEREOF

Gary Dale Ellis, Dallas, and Joe Drahn Foster, Houston, both of Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Dec. 20, 1974, Ser. No. 535,000
Int. Cl.² E21B *43/26, 43/00*
U.S. Cl. 166—302 **9 Claims**



1. Retention apparatus for well tools having radially movable components, said retention apparatus comprising:

an elongated tubular sleeve arranged to enclose the well tools and initially having a passage therethrough larger than the well tool; and,

said tubular sleeve being comprised of an elastomeric selectively shrinkable material which has been preselectively shrunk into a snug fitting resilient relationship on the well tool.

7. A method of retaining expandable elements on a well tool; said method comprising

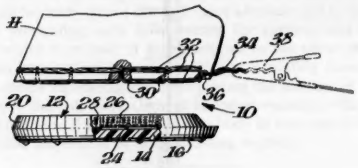
placing over the well tool in the area of the expandable elements a sleeve of shrinkable elastomeric material; and,

activating said shrinkable material to shrink said sleeve into tight-fitting elastic relationship on said well tool.

3,917,000
HORSESHOE MANUFACTURE

Dudley W. C. Spencer, 619 Shipley Road, Wilmington, Del. 19809

Continuation-in-part of Ser. No. 252,546, May 12, 1972, Pat. No. 3,782,473, which is a continuation-in-part of Ser. No. 71,121, Sept. 10, 1970, Pat. No. 3,664,428. This application Dec. 20, 1973, Ser. No. 426,446
Int. Cl.[2] A01L *1/00*
U.S. Cl. 168—4 32 Claims

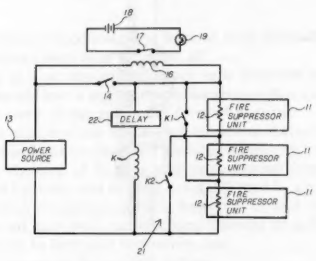


1. A horseshoe assembly comprising a shoe element, said shoe element having a body member with a lower wear surface and an upper securing surface, said shoe element being generally U-shaped, adhesive means on said shoe element, hoof-threading means for being threaded through holes in a hoof of a horse, and said hoof-threading means including elongated strands for being in direct contact with said adhesive means over an area substantially less than the area of said upper securing surface and extending away from said shoe element toward the hoof to thereby secure said assembly to the hoof.

3,917,001
FIRE PROTECTION SYSTEM

Robert F. Davis, Framingham, and Carl I. Swanson, Boylston, both of Mass., assignors to Walter Kidde & Co., Inc., Clifton, N.J.

Filed Aug. 27, 1974, Ser. No. 500,864
Int. Cl.[2] A62C *37/04*
U.S. Cl. 169—61 12 Claims

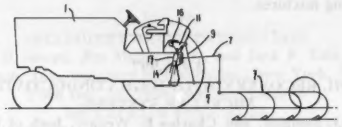


1. An electrical protection system comprising:
a plurality of suppressor units activatable to suppress an abnormal condition;
a plurality of electrical current responsive activators, one associated with each of said suppressor units and adapted to induce activation thereof;
electrical current supply means;
control circuit means connecting said activators in series and comprising actuator means for initiating activating current flow from said supply means to said series connected activators; and
auxiliary circuit means comprising switch means for connecting said activators in parallel in response to initiation of activating current flow by said actuator means.

3,917,002
DRAFT CONTROL LINKAGE FOR A TRACTOR

Otto Mueller, Jr., Detroit, Mich., assignor to Massey-Ferguson Inc., Detroit, Mich.

Continuation of Ser. No. 189,662, Oct. 15, 1971, abandoned. This application July 9, 1973, Ser. No. 377,869
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.[2] A01B *63/112*
U.S. Cl. 172—9 5 Claims



1. In a tractor having draft linkage for connecting the tractor to an implement, hydraulic means including valve means for controlling the vertical position of the draft linkage, draft sensing means for measuring changes in draft loads in the draft linkage, means for operating the valve means in accordance with changes in the draft loads to condition the valve means to raise, hold or lower the implement, operator-set draft input means, a draft control linkage interconnecting the draft sensing means, the operator set draft input means and the valve operating means so that changes in draft forces in the draft linkage from a value set by the operator-set draft input means will condition the valve means to hold or lower the linkage to establish and maintain said set value, the valve operating means including a reciprocable control rod operatively connected to the valve means characterized by said draft control linkage comprising a first member pivotable about a first fixed axis by said operator set draft input means, a second member operatively connected to the control rod and pivotally mounted on said first member on a second movable axis spaced from the fixed axis, said draft sensing means operatively connected to the second member to rotate it about the second axis.

3. In a tractor having draft linkage for connecting the tractor to an implement, hydraulic means including valve means for controlling the vertical position of the draft linkage, draft sensing means for measuring changes in draft loads in the draft linkage, means for operating the valve means in accordance with changes in the draft loads to condition the valve means to raise, hold or lower the implement, operator-set draft input means, a draft control linkage interconnecting the draft sensing means, the operator set draft input means and the valve operating means so that change in draft forces in the draft linkage from a value set by the operator-set draft input means will condition the valve means to hold or lower the linkage to establish and maintain said set value, second operator-set maximum depth position input means, position sensitive means responsive to the vertical position of the draft linkage, the valve operating means including a control rod characterized by a floating lever pivotally connected to the control rod at a first location, the position sensitive means pivotally connected to the lever at a second location and the second operator-set maximum depth means connected to the floating lever at a third location.

3,917,003
ROTARY ROD WEEDER ATTACHMENT FOR GRAIN PLANTING DRILLS AND THE LIKE

Frank C. Michels, Beach, N. Dak.

Filed Dec. 12, 1973, Ser. No. 426,664
Int. Cl.[2] A01B *39/19*
U.S. Cl. 172—44 4 Claims

1. A rotary rod weeder attachment adapted for mounting upon a wheeled vehicle chassis and comprising a frame means, a plurality of elongated vertical strut members each having an

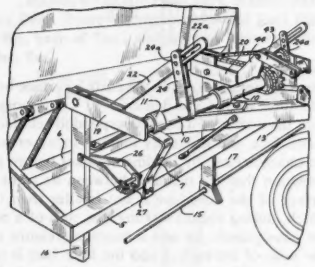
elongated axis extending along said elongated dimension, said struts being mounted for rockable substantially axially up and down vertical movement on said frame means, and strut mounting means securing said strut members to said frame means and to said vehicle chassis,

a. a rotatable weeder rod journaled at the lower ends of said strut members and supported thereby,

b. rotary driving means connected with said weeder rod for driving the same,

c. spring means for normally holding said strut members in downwardly projected operative position but yielding upon impact against the rod or strut members to accommodate retraction thereof in response to unyielding impact,

d. said strut mounting means comprising a bell crank supporting structure at the upper end thereof with angularly



disposed arms extending rearwardly from a first pivot point and with said supporting structure being pivotally mounted at the top of said strut members with yieldable spring means for normally yieldably holding said strut members in downwardly projected operative position, and stabilizing arms disposed intermediate the ends of said strut members and in substantially parallel relation to said bell crank supporting structure and being pivotally coupled to said strut members and to said frame means at a second pivot point spaced from said first pivot point to produce a parallelogram support structure for each of said strut members and thus produce substantially vertical rockable up and down movement thereof about said spaced first and second pivot points against the force of impact by the forward surfaces of said strut members and rod against an unyielding obstruction in the ground being weeded.

3,917,004

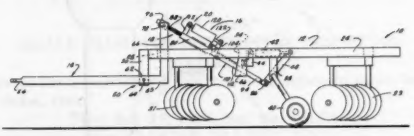
ADJUSTMENT MEANS FOR OFFSET DISC

Delbert D. Finley, R.R. No. 1, Latham, Kans. 67072

Filed Dec. 3, 1973, Ser. No. 421,083

Int. Cl.[2] A01B *63/22, 65/00*

U.S. Cl. 172—328 **2 Claims**



1. In a common disc-like plow implement having a frame means rigidly supporting a disc assembly having a plurality of spaced discs mounted on a rotatable shaft to turn with same, and having a tongue means pivotally mounted on said frame means for operably connecting said implement with a towing vehicle, said tongue means being pivotal relative to said frame means to change the angular position of said disc assembly relative to the ground, the improvement, comprising, an adjustment means for said disc assembly comprising:

a. a telescopic member pivotally mounted in one end portion with said tongue means and pivotally mounted on its opposite end portion with said frame means,

b. said telescopic member having a first end portion pivotally mounted with said tongue means and a second end portion slidably engaged with said first end portion, said second end portion being mounted with said frame means,

c. a fluid actuated piston and cylinder powering means having an extendable and retractable piston rod and having one end thereof mounted with said telescopic member first end portion and having an opposite end thereof mounted with said telescopic member second end portion to in operation vary the length of said telescopic member, thereby changing the relative position of said tongue means and said disc assembly which further changes the angular position of said disc assembly relative to the ground level, said telescopic member first end portion having a mount member resiliently mounted on one end portion thereof and a lug member rigidly secured on said one end portion thereof, said telescopic member second end portion having a lug member on a mid portion thereof, a free end portion on one end portion thereof and a mounting yoke on its opposite end portion, said free end portion being engagable with said telescopic member first end portion, said telescopic member first end portion having a stop member to limit retraction of said telescopic member second end portion, and

d. said adjustment means having a locking member removably mounted with said telescopic member to in use engage said second end portion of said telescopic member and said frame means to limit retraction of said telescopic member and fix the relative position of same and said disc assembly.

3,917,005

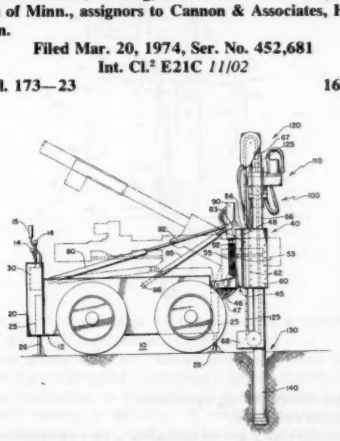
UNDERGROUND BLAST HOLE DRILLING MACHINE

Robert E. Cannon, Hibbing, and Walter L. Pehoski, St. Paul, both of Minn., assignors to Cannon & Associates, Hibbing, Minn.

Filed Mar. 20, 1974, Ser. No. 452,681

Int. Cl.[2] E21C *11/02*

U.S. Cl. 173—23 **16 Claims**



1. A mobile drilling machine comprising, a mobile steerable support vehicle, a head frame, means pivotally mounting the head frame on one end of the support vehicle at a point intermediate the extent of the head frame and through at least one pivot axis, a drill head slidably mounted in the head frame and adapted to be reciprocated from one end of the head frame and to the other, said drill head including flanged extremities at the edges of the same and bearing material mounted in the

flanged extremities on three sides thereof and bearing against three surfaces of each side of the head frame for slidably mounting the drill head on the head frame, a drive shaft positioned on said one end of the said head frame and having a reversible drive motor and a speed reducer attached to one end of the shaft thereof, sprocket wheels mounted on the shaft, stud shafts positioned at the other end of the head frame and mounting sprocket wheels thereon, said reversible drive motor including a rotary hydraulic motor and a harmonic speed reducer connected thereto and coupling the rotary drive motor to the drive shaft to impart reduced and variable and reversible rotation to the drive shaft and the sprocket wheel thereon, drive chains positioned over the sprocket wheels at the ends of the head frame and connected to the drill head for reciprocating the same in the head frame, an offset drilling motor mounted on the drill head and adapted to mount and rotate the drill rod thereon to extend toward said other end of said head frame, a drill tool means having additional drive means mounted on the rod for providing impact action to a portion of the drill rod, and means connected to the head frame and the support vehicle for pivoting the head frame through varying drilling angles with respect to the support vehicle and for locking the head frame in the various pivoting positions to effect drilling through the drill motor and the motor driving the drive shaft on the head frame.

3,917,006

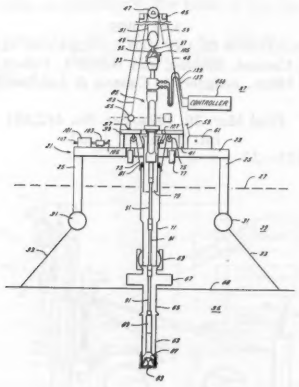
FLOORLEVEL MOTION COMPENSATOR

Jackson M. Kellner, Midland, Tex., assignor to Smith International, Inc., Houston, Tex.

Continuation of Ser. No. 293,363, Sept. 29, 1972, abandoned. This application Aug. 19, 1974, Ser. No. 498,831

Int. Cl.[2] E21B *19/08*

U.S. Cl. 175—5 **28 Claims**



25. In a rotary drilling apparatus,

a string of drill pipe,

a hoist carrying a swivel including a part rotatable relative to the hoist, and

a combined driving joint and axial motion compensator means connected between the string of drill pipe and said rotatable part of the swivel to allow relative axial motion of the string of drill pipe and swivel and at the same time transmit fluid and axial force and torque therebetween,

said combined driving joint and axial motion compensator means being disposed adjacent the swivel at the uppermost end of the string of drill pipe.

3,917,007

METHOD OF SINKING HOLES IN EARTH'S SURFACE

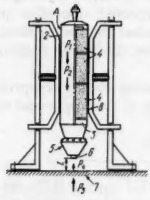
Mikhail Ivanovich Tsiferov, ulitsa Druzhinni-kovskaya, 11a, kv. 22, Moscow, U.S.S.R.

Filed Oct. 10, 1973, Ser. No. 404,911

Claims priority, application U.S.S.R., June 7, 1973, 1920252

Int. Cl.[2] E21B *7/14*; E21C *21/00*

U.S. Cl. 175—14 **5 Claims**



1. A method of sinking holes in the earth's surface by working the hole face with a gas-dynamic jet continuously discharged from the nozzle of a rocket suspended relative to the hole walls and face and gradually moving together with the sinking face characterized by holding a rocket before starting in such a position that the distance between its front nozzle and the surface of the hole face is not smaller than the distance at which, during rocket starting, the sum of a reaction force of the gas-dynamic jet and a counter-pressure arrising between the nose of the rocket and the hole face is counter balanced by forces driving the rocket towards the hole face, selecting said forces to exceed the sum of the reaction force and forces of friction against the rocket body of the particles of rock and the stram waste gases flowing between the rocket and the hole walls, and selecting the amount of gas in the gas-dynamic jet so that the velocity of the waste gases would exceed the velocity at which the particle of broken rock of a maximum pre-set size and mass is in the state of weightlessness, wherein the gap between the rocket body and the hole walls is about half the maximum rocket diameter.

3,917,008

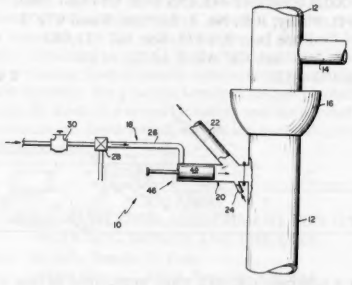
APPARATUS AND PROCESS FOR PREVENTING BLOW-OUTS

William R. Suter, Houston, Tex., assignor to Cities Service Company, Tulsa, Okla.

Filed Oct. 29, 1974, Ser. No. 518,828

Int. Cl.[2] C09K *7/00*; E21B *41/00*

U.S. Cl. 175—38 **17 Claims**



1. Blow-out prevention apparatus for an oil well comprising:

A. a surface casing,

B. a mud return means leading from said casing,

C. a blow-out preventer means attached to said casing,

D. a mud diverter valve means connected with said casing, said valve means comprising:

a. a cylindrical sleeve having a diverted-mud inlet end which leads into said casing, a biasing end, and a diverted-mud outlet opening in the side wall of the sleeve

b. a piston housed in said sleeve which is slideable back and forth between said ends of the sleeve, said piston having a mud contact end and a biased end

c. a mud diverter conduit leading from said sleeve through said outlet opening, and

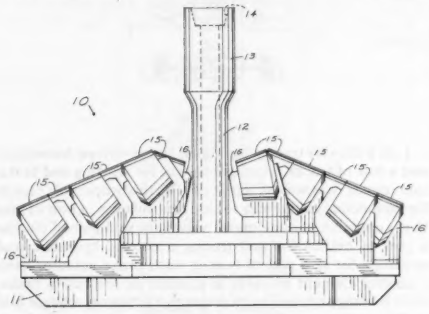
d. biasing means for resiliently biasing said piston from the biasing end thereof toward said mud-inlet end of the sleeve until said outlet opening thereof is covered by said piston.

3,917,009

REMOVABLE STEM FOR RAISE BITS

Norman Dean Dyer, Plano, and Howard Earl Mitchell, Duncanville, both of Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Sept. 16, 1974, Ser. No. 506,667
Int. Cl.² E21C *23/00*; **E21B** *9/24*
U.S. Cl. 175—53 **8 Claims**



7. A raise bit for enlarging a pilot hole into a larger diameter hole by disintegrating earth formations surrounding the pilot hole, comprising:

a drive stem having an upper end for projecting into said pilot hole and a lower end;

a cutter stage body;

a multiplicity of saddles mounted on said cutter stage body;

a multiplicity of rolling cutters positioned in said saddles;

a collar positioned around the lower end of said drive stem and connected to said cutter stage body, said collar having an inner conical surface that tapers inward toward said drive stem in the direction of said upper end; and

a retaining element means positioned between said collar and said drive stem, said retaining element means having a tapered outer surface adapted to mate with said conical inner surface.

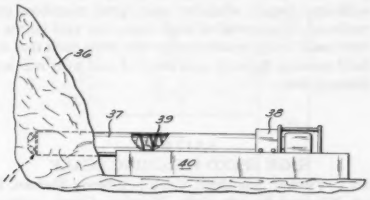
3,917,010

SMALL DIAMETER HORIZONTAL TUNNELING MACHINE

Trevor Fink, University Heights, Ohio, assignor to Jarva, Inc., Solon, Ohio

Filed July 25, 1974, Ser. No. 491,766
Int. Cl.² E21B *7/04, 9/34, 3/02*
U.S. Cl. 175—73 **8 Claims**

1. In combination, a tunnel having an end face and a portal, and a tunneling machine; said tunneling machine comprising a head assembly, a multiple section tunnel liner, a multiple section rotatable drive shaft, and axial thrust unit means; said head assembly including a support section movable in said tunnel in the axial direction and a rotatable section movable in said tunnel in both the axial and the rotational directions, said rotatable section including cutter means for engaging said end face of said tunnel for removing material from said end face, said rotatable section being rotatably journaled on said support section by bearing means, said bearing means preventing relative axial movement between said rotatable section and said support section whereby axially advancing movement of said support section axially advances said movable section; said rotatable drive shaft being operatively connected



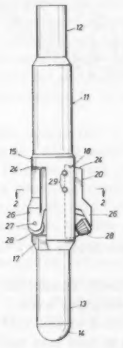
to said rotatable section and providing the sole means for rotating said rotatable section; said thrust unit means being disposed outside of said tunnel at said portal, said thrust unit means being operatively connected to said tunnel liner and said tunnel liner being operatively connected to said support section, and said thrust unit means axially advancing said support section and said rotatable section together in said tunnel by application of an axial force to the end of said tunnel liner at said portal.

3,917,011

HOLE-OPENER TOOL

John W. Hester, 242 Idlewild Drive, Houma, La. 70360

Filed July 22, 1974, Ser. No. 490,256
Int. Cl.² E21B *9/10, 9/24*
U.S. Cl. 175—339 **4 Claims**



1. In a hole opener tool for use in drilling a well-bore to a larger diameter, the combination comprising:

a body arranged for attachment at the upper end thereof to a rotary drill string and having a lower end dimensioned for positioning in the well-bore to be drilled larger, said body having a plurality of vertically extending slots spaced circumferentially thereabout, said slots each being dove-tailed in transverse section and closed at the upper end thereof and open at the lower end thereof, and said body having bore means therethrough communicating with the bore of said drill string for conducting drilling fluid therethrough;

a removable cutter arm adapted for insertion into and retention in each of said slots through said lower open end and abutment against said closed upper end, said arms each having a dove-tailed retaining portion on the radially

inward side thereof mateably engageable in one of said slots for holding said arms against circumferential and radial displacement relative to said body, and each of said arms having a bore therethrough communicating with said bore means of said body;

retainer means carried by said body for holding said arms against longitudinal displacement relative to said body;

and a rolling cone cutter member carried by each of said arms for cutting away adjacent portions of the wall of said well-bore upon rotation of said body to thereby drill said well-bore larger, whereby said cutter members may be replaced by removal of said arms, and said cutter members each being positioned in said arms such that drilling fluid passing through said bore of said arm will impinge thereagainst.

3,917,012

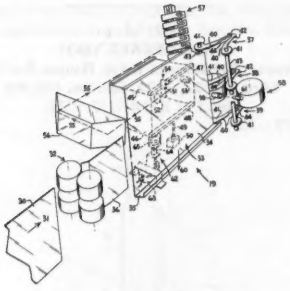
HIGH SPEED WEIGHING SCALE

Fredric E. Zucker, Stamford, Conn.; Anthony Storace, Tarrytown, NY, and Paul R. Sette, Hamden, Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Division of Ser. No. 476,655, June 5, 1974, Pat. No. 3,861,480. This application Nov. 11, 1974, Ser. No. 522,712

Int. Cl.² G01G *23/14, 3/08, 23/26;* **G01D** *5/34;* **H01J** *39/12*

U.S. Cl. 177—170 **6 Claims**



1. A zero-adjustment device for a weighing scale, comprising:

a coil spring operatively connected to a weight responsive member of said weighing scale;

a lead screw connected to said coil spring;

a motor connected to said lead screw for turning said lead screw and thereby exerting a force upon said coil spring and said weight responsive member connected to said coil spring, said force acting to adjust the weight responsive member to a zero position; and

position sensing means operatively connected to said motor for sensing the position of the weight responsive member of said weighing scale, and for activating said motor when the position of the weight responsive member is other than at said zero position, said position sensing means comprising a light source and photodetector means operatively connected to said motor and receiving light from said light source, said weight responsive member acting to block the light from said light source to said photodetector menas when said weight responsive member is other than at said zero position, whereby the photodetector means causes said motor to activate to adjust the position of said weight responsive member.

3,917,013

SINGLE PEDAL BRAKING SYSTEM FOR CRAWLER TRACTOR

Bobby J. Orr, Springfield, Ill., assignor to Fiat-Allis Construction Machinery, Inc., Deerfield, Ill.

Filed Oct. 21, 1974, Ser. No. 516,287

Int. Cl.² B62D *11/08*

U.S. Cl. 180—6.7 **6 Claims**

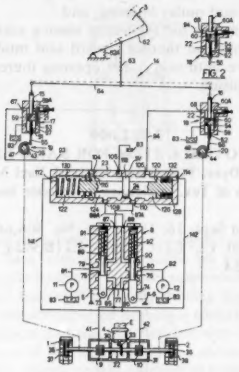


FIG. 2

1. In a crawler tractor having an engine-driven transmission and a pair of tracks, a control system for steering and braking said tractor comprising: a pair of selectively operable clutches for connecting said tracks to said transmission, a pair of selectively operable clutch control valves for said pair of clutches, a pair of brakes for said tracks, a pair of hydraulic brake actuators for said pair of brakes, each brake actuator having a control element movable to operate its respective brake if fluid is being supplied to its respective actuator, a single brake pedal mechanically connected to each said control element for simultaneously operating the control elements of both of said brake actuators, a source of fluid connected to said clutch control valves, and a fluid operated shuttle valve connected between said clutch control valves and said brake actuators for controlling fluid flow from said source to said brake actuators in response to fluid flow conditions between said clutch control valves and said clutches indicative of the condition of said clutches, said shuttle valve being operable to direct fluid to both brake actuators when both clutches are operated together whereby actuation of said single brake pedal operates both brakes, said shuttle valve being further operable to direct fluid to only one brake actuator when only one clutch is operated whereby actuation of said single brake pedal operates only one brake.

3,917,014

HYDROSTATIC DRIVING AND STEERING TRANSMISSION

Harold R. Ward, Marshall, Mich., assignor to Eaton Corporation, Cleveland, Ohio

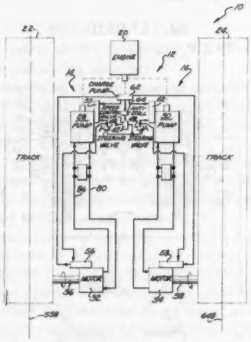
Filed Apr. 28, 1972, Ser. No. 248,498

Int. Cl.² B60D *11/04*

U.S. Cl. 180—6.48 **17 Claims**

1. An apparatus comprising a plurality of hydrostatic transmissions having pump and motor units, first actuator means for varying the effective displacement of at least one unit of one of the hydrostatic transmissions in response to a variation in fluid pressure conducted to said first actuator means, second actuator means for varying the effective displacement of at least one unit of another one of the hydrostatic transmissions in response to a variation in fluid pressure conducted to

said second actuator means, first, valve means for varying the fluid pressure conducted to said first actuator means to enable the displacement of the one hydrostatic transmission to be varied while maintaining the displacement of the other hydrostatic transmission constant, second valve means for varying the fluid pressure conducted to said second actuator means to enable the displacement of the other hydrostatic transmission to be varied while maintaining the displacement of the one hydrostatic transmission constant, first conduit means connected in fluid communication with said first and second valve means and a source of fluid pressure for conducted fluid pressure to said first and second valve means from the source of fluid pressure, second conduit means connected in fluid communication with said first valve means and said first actuator means for conducting fluid to and from said first actuator means, third conduit means connected in fluid communication with said second valve means and said second actuator means for conducting fluid to and from said second actuator means, said first valve means including first flow control means for restricting fluid flow from said first conduit means



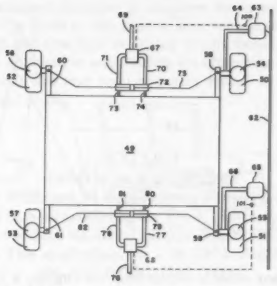
through said first valve means to said second conduit means to maintain the fluid pressure conducted to said second valve means by said first conduit means substantially constant upon operation of said first valve means to thereby enable the displacement of the one hydrostatic transmission to be varied while maintaining the displacement of the other hydrostatic transmission constant, said first flow control means further including means for enabling fluid to flow in an unrestricted manner from said first actuator means through said second conduit means, said second valve means including second flow control means for restricting fluid flow from said first conduit means through said second valve means to said third conduit means and said second actuator means to maintain the fluid pressure in said first conduit means substantially constant upon operation of said second valve means to thereby enable the displacement of the other hydrostatic transmission to be varied while maintaining the displacement of the one hydrostatic transmission constant, said second flow control means further including means for enabling fluid to flow in an unrestricted manner from said second actuator means through said third conduit means.

3,917,015

VEHICLE STEERING CONTROL

Royal R. Hawkins, Bloomington, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Division of Ser. No. 172,333, Aug. 2, 1971, Pat. No. 3,848,690.
This application June 19, 1973, Ser. No. 371,434
Int. Cl.[2] B62D 11/04
U.S. Cl. 180—6.48 **6 Claims**



1. A system to control the steering of a vehicle having a right side and a left side and further having right and left, front and back propelling means capable of being driven at variable speeds, said system comprising:

first variable speed driving means for providing an output signal to drive said right, front and back propelling means;

second variable speed driving means for providing an output signal to drive said left, front and back propelling means;

first and second output terminal means connected to said first and second variable speed driving means respectively for receiving said output signals and adapted to be connected to respective ones of said right and left, front and back propelling means for controlling the speed thereof; input terminal means adapted to be connected to a source of power;

steering control means connected to said input terminal means for providing an output signal to control turning of said right and left, front and back propelling means;

third output terminal means connected to said steering control means for receiving said output signal therefrom and adapted to control the turning of said right and left, front and back propelling means; and,

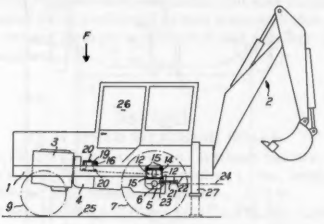
transducer means connected between said terminals and said variable speed driving means adapted to be responsive to the turning of the propelling means controlled by said steering control means for adjusting said variable speed driving means,

wherein said transducer means comprises a first potentiometer having a first resistive element connected to said input terminal means and a first wiper arm adapted to be responsive to the turning of said right front and left front propelling means, said wiper arm being connected from said first resistive element to said first variable speed driving means, said transducer means further comprising a second potentiometer having a second resistive element connected to said input terminal means and a second wiper arm adaptive to be responsive to the turning of said right back and left back propelling means, said second wiper arm being connected between said second resistive element and said second variable speed driving means, whereupon said propelling means are turned to control the direction of the vehicle and the speeds of the propelling means are differentially varied to aid in the steering of the vehicle.

3,917,016
VEHICLE, SIMILAR IN TYPE TO A TRACTOR, COMPRISING A RIGID ASSEMBLY

René G. Stoufflet, Senlis, France, assignor to Poclain, Le Plessis Belleville, France

Filed May 13, 1974, Ser. No. 469,684
Claims priority, application France, May 23, 1973, 73.18743
Int. Cl.² B60K 7/00
U.S. Cl. 180—57 **6 Claims**



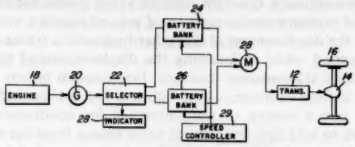
1. A tractor vehicle comprising an engine, a driven axle, driving means attached to said driven axle for engagement with a supporting surface to provide movement of said vehicle, a transmission case coupling said engine to said driven axle, said engine, driven axle and transmission case being coupled together to define a unitary rigid drive component assembly, a separate equipment chassis completely separate from the unitary rigid drive component assembly, a piece of plant equipment mounted on said separate equipment chassis, resilient suspension means providing supporting connection between said unitary rigid drive component assembly and said equipment chassis and link means respectively hinged on opposite ends to said equipment chassis and to said rigid drive component assembly for restraining front to rear movement of said drive component assembly with respect to said equipment chassis, said resilient suspension means comprising compression type resilient members mounted in vertical alignment above said driven axle and below a rear portion of said equipment chassis maintained in compression between said driven axle and said equipment chassis by the weight of said equipment chassis and a tension type resilient member having an upper end attached to said equipment chassis and having a lower end attached to said rigid drive component assembly and extending between said unitary rigid drive component assembly and said separate equipment chassis in tension and in general alignment with the centerline of said vehicle and a second vehicle supporting axle attached to said chassis wherein said tension type resilient member is horizontally spaced between said second axle and said driven axle so that said separate equipment chassis can accept the stresses created by said plant equipment and absorb impacts and vibrations created by the plant equipment so as to lessen the impacts and vibrations conveyed to said unitary rigid drive component assembly.

3,917,017
BATTERY OPERATED VEHICLE DRIVE

Clifford T. Deane, South Charleston, W. Va., assignor to West Virginia High Bird Corporation(Entire), St. Albans, W. Va.

Continuation-in-part of Ser. No. 436,683, Jan. 25, 1974, Pat. No. 3,874,472. This application Dec. 9, 1974, Ser. No. 531,102
Int. Cl.² B60L 11/12
U.S. Cl. 180—65 R **12 Claims**

1. In combination with a vehicle having a fuel combustion engine, a drive propelling transmission, a drive motor connected to the transmission for propelling the vehicle, a generator driven by the engine, at least two energy storing battery assemblies each having a plurality of power terminals at different energy levels, a charging circuit connected to the generator for storing energy developed by the generator in the battery assemblies, selector means connected to the charging circuit for selecting one of the battery assemblies within which

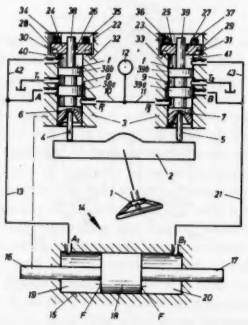


said energy is stored, and speed controlling means connecting the drive motor to a selected one of the power terminals in the other of the battery assemblies for energizing the drive motor with energy stored at a corresponding one of the energy levels.

3,917,018
DEVICE FOR CHANGING THE HYDRAULIC TRANSMISSION RATIO OF SERVO-MOTOR STEERING MECHANISMS

Gunther Strauff, Kaarst, Germany, assignor to Langen & Company, Duesseldorf, Germany

Filed Nov. 12, 1973, Ser. No. 415,167
Claims priority, application Germany, Nov. 16, 1972, 2256074
Int. Cl.² B62D 5/08
U.S. Cl. 180—79.2 R **4 Claims**



1. In a vehicle having a steering wheel and steerable road wheels and a power transmission including two sections interposed between said steering wheel and steerable wheels, a pressure-control device having control pistons movable in a bore and which react to minute rotations of the two sections of the power transmission for controlling a servo-steering mechanism having a servo-motor, and a pair of reaction members which respectively operate within said two sections, each of said reaction members comprising a hydraulic piston which is provided with at least one effective area stressable by the pressure of the working or operating space of the servo-motor and thus signals back to the steering wheel a proportional power which is to be developed by the servo-motor, and in which said hydraulic pistons comprise said control pistons of the pressure-control device, the improvement which comprises a projection extending from each of said hydraulic pistons at their side opposite to the actuating side, an annular reaction chamber surrounding each projection at one part of its length, a plate having a through bore in which the remaining part of the length of each of said projections is tightly guided, said plate positioned over and sealing the bores of the pistons in a pressure-tight manner, each projection being frontally stressed by a substantially constant pressure, each plate being axially non-displaceable, the hydraulic transmission ratio of said servo-steering mechanism being determin-

able in part by the diameters of said through bores and said projections extending therethrough.

3,917,019

VEHICLE AND SAFETY DEVICE FOR SAME

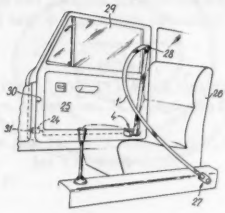
Leonard Charles Pearson, Wokingham, and Victor James Jehu, Crowthorne, both of England, assignors to National Research Development Corporation, London, England

Filed Mar. 5, 1973, Ser. No. 338,264

Claims priority, application United Kingdom, Mar. 6, 1972, 10300/72

Int. Cl. B60r *21/10*

U.S. Cl. 180—82 C **5 Claims**



1. A vehicle safety device comprising:
an occupant-restraining member;
means for supporting one end of said member from a door of said vehicle whereby said occupant-restraining member automatically fits itself around an occupant of the vehicle as the door is closed;
non-electric tensioning means for said member, said tensioning means operating to hold said member taut but unlocked in its occupant-restraining position during normal running motion of said vehicle;
a locking device responsive to the onset of a rapid deceleration of said vehicle, said locking device operating to lock said member in its said tautly-held position;
a check device operable to inhibit said tensioning means to thereby permit said member to go slack; and
triggering means responsive to a condition which normally exists when the occupant is normally entering and exiting the vehicle for actuating said check device into its tension means inhibiting condition.

2. A vehicle safety device according to claim 1 wherein: said condition comprises the open state of said door.

3,917,020

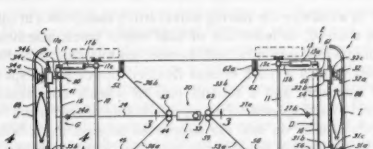
VEHICLE SAFETY APPARATUS

Amin Melhem Saab, 1212 Main St., Houston, Tex. 77002

Filed Sept. 20, 1971, Ser. No. 181,802

Int. Cl.² B60T *1/14*

U.S. Cl. 180—93 **12 Claims**



1. Apparatus for stabilizing a vehicle under emergency conditions, comprising:
front road engaging means for mounting at the front of said vehicle for movement between a retracted position and an actuated position in which said front road engaging means engages the road to stabilize said vehicle;
rear road engaging means for mounting at the rear of said vehicle for movement between a retracted position and an actuated position in which said rear road engaging means engages the road to stabilize said vehicle;
front and rear sensor means for mounting at the front and rear of said vehicle, respectively, for operable connection with said front and rear road engaging means for releasing said front and rear road engaging means for movement to said actuated positions in response to an impact against either the front or the rear of said vehicle; and
said front and rear road engaging means including absorber means attached to said vehicle for absorbing the shock of said front and rear road engaging means in engagement with said road.

3,917,021

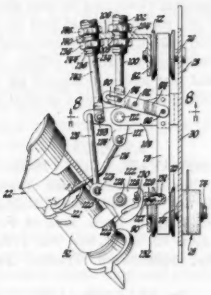
CONTROL MECHANISM

Richard D. Williams, 31 Fourth Ave., Fairport, N.Y. 14450, and Fred G. Michaels, 4 Saxony Road, Pittsford, N.Y. 14534

Division of Ser. No. 325,325, Jan. 23, 1973, Pat. No. 3,844,180. This application Aug. 19, 1974, Ser. No. 498,754

Int. Cl.² B60R *25/02, 25/08*

U.S. Cl. 180—114 **5 Claims**

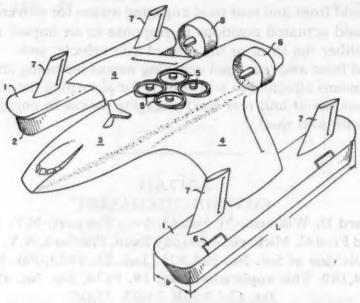


1. A control mechanism comprising a transmission shift control assembly having a plurality of ratio control positions including Park, a lock mechanism adapted to having a key manually operable therewith; a device to be controlled; and a linkage system operatively connected among said lock mechanism, said device to be controlled, and said shift control assembly, said linkage system including first and second pivotally interconnected and pivotally mounted plate members, a first linkage member pivotally connected at one end thereof to said first pivotally mounted plate member and at the other end thereof to said lock mechanism, an actuator member pivotally mounted on said first pivotally mounted plate member for connection with said device to be controlled, locking means operatively connected between said second plate member and said transmission shift control assembly for enabling locking said device to be controlled via said actuator member in response to movement of said first pivotally mounted plate member by said first linkage member resulting from manual movement of said key into said Lock position in said lock mechanism, said locking means being adapted to locking said second plate member and said transmission shift control assembly and thus permitting said movement of said key into said Lock position only when said shift control assembly is in said Park position.

3,917,022
TWIN CUSHION SURFACE EFFECT VEHICLE

Eugene N. Brooks, Jr., Sterling, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 18, 1974, Ser. No. 489,774
Int. Cl.² B60V 1/02
U.S. Cl. 180—127 2 Claims

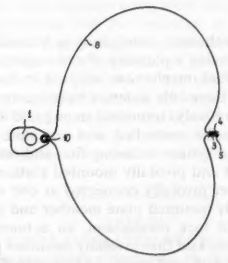


1. A catamaran type surface effect vehicle which is supported during its operation by an air cushion comprising:
a first independent elongated flexible skirted air cushion;
a second independent elongated flexible skirted air cushion spaced from and parallel to said first air cushion;
an efficient aerodynamic lift airfoil and semi-rigid structural member, operating in ground effect, connecting and separating said first and said second air cushions; and a plurality of lifting fans mounted on said airfoil.

3,917,023
INFLATABLE SUN VISOR

Daniel De Rosa, Boulogne-Billancourt, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt and Automobiles Peugeot, Paris, both of, France

Filed June 13, 1974, Ser. No. 479,186
Claims priority, application France, July 18, 1973, 73.26314
Int. Cl.² B60R 21/08
U.S. Cl. 280—150 AB 2 Claims

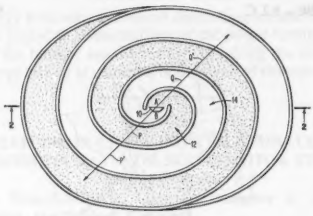


1. Device for protecting the passengers of a motor vehicle, comprising: a sun visor; a multiple energy-damping inflatable means disposed in the sun visor and consisting of a support unit comprising a bellows structure adapted to be either spread or expanded, and provided with a gas generator consisting of a stick of explosive powder, one portion of said bellows being rigidly secured to the sun visor from which the passengers are to be protected, and the other portion being releasably secured to said support for releasing said other portion during the inflation of said bellows, said gas generator being adapted to be released electrically by means of an inertia electric switch or any other similar device.

3,917,024
SOUND RADIATING STRUCTURE

Julius A. Kaiser, Jr., 10408 Detrick Ave., Kensington, Md. 20795

Filed Oct. 26, 1973, Ser. No. 410,140
Int. Cl.² G10K 13/00; H04R 7/00
U.S. Cl. 181—163 2 Claims

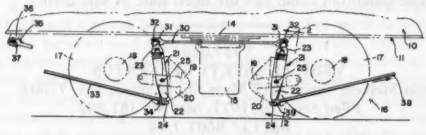


1. A sound radiating structure comprising:
a. a first spiral shaped totally enclosed sound transmission chamber having a flexible portion,
b. a second spiral shaped totally enclosed sound transmission chamber having a flexible portion and concentrically disposed about said first chamber, and
c. sound producing means positioned adjacent said first chamber and said second chamber to cause sound waves to pass through said first and said second transmission chambers whereby said flexible portions will vibrate to produce secondary sound waves.

3,917,025
BRAKE RIGGING FOR RAILWAY CARS

Donald B. Yates, Park Forest, and George S. McNally, South Holland, both of Ill., assignors to Pullman Incorporated, Chicago, Ill.

Filed Oct. 15, 1974, Ser. No. 514,337
Int. Cl.² B61H 13/26
U.S. Cl. 188—52 9 Claims



1. In a railway car having wheel truck assemblies at opposite ends thereof, at least one of said wheel truck assemblies including a first pair of wheels connected by a first axle disposed on one side of a truck bolster flexibly supported on springs by said assembly and a second pair of wheels connected by a second axle disposed on the opposite side of said truck bolster, a body bolster on said car supported on said truck bolster,
a brake system for said car including a pair of brake beams each supported on opposite sides of said truck bolsters and including brake shoes adapted to engage said wheels, a brake rigging rod extending underneath said first axle, a brake lever pivotally connected to each brake beam for pivotal movement relative thereto,
a brake lever connecting rod pivotally connected to said brake levers,
said brake lever connecting rod extending longitudinally,

means pivotally connecting said brake rigging rod to one of said brake levers on one side of said first axle,

anchoring means pivotally connected to said other brake lever on the other side of said second axle, the improvement comprising;

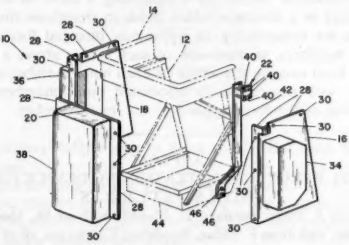
each of said brake levers comprising first and second portions, said brake lever connecting rod being connected to said first portions, said brake rigging rod and anchoring means being respectively connected to said second portions,

means interconnecting said first and second portions of said brake levers to permit relative movement therebetween to accommodate variations in vertical dimension between the points of connection of said brake levers to said brake beams, and said brake lever connecting rod to said first portions, such variations occuring upon flexing of said springs during operation.

3,917,026
AERIAL PLATFORM UTILITY ENCLOSURE ASSEMBLY

Melvin R. Hedges, Littlestown, Pa., assignor to Cam Industries, Inc., Hanover, Pa.

Filed Jan. 16, 1975, Ser. No. 541,443
Int. Cl.² B66F *11/04*
U.S. Cl. 182—129 **7 Claims**

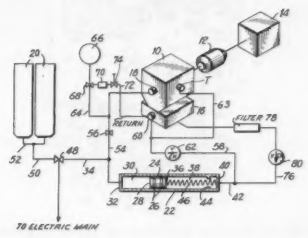


1. An unenclosed aerial lift platform having a base member with a plurality of vertically extending interconnected structural frame members affixed thereto, in combination with means to enclose the front and two sides of the otherwise unenclosed structural frame of said platform, said enclosing means comprising a modular three-part panel assembly having a first uniconstructed panel member thereof being dimensionally formed into a peripheral geometric side planar profile configured to fit and be fixedly connected in flush abuttment to the outer structural frame member surfaces of one side of said unenclosed platform, and having molded within the peripheral dimensional limits of said first panel member an outwardly deposed geometrically configured implement storage compartment; a second uniconstructed panel member dimensionally formed into a peripheral geometric side planar profile configured to fit and be fixedly connected in flush abuttment to the outer structural frame member surfaces of another side of said unenclosed platform, and having molded within the peripheral dimensional limits of said second panel member an outwardly deposed geometrically configured implement storage compartment; a third uniconstructed panel member thereof being dimensionally formed into a peripheral geometric side planar profile configured to fit and be fixedly connected in flush abuttment to the outer structural frame member surfaces of the front side of said unenclosed platform, and having molded within the peripheral dimensional limits of said third panel member an outwardly deposed geometrically configured accessory drawer cabinet compartment; whereby the attachment of said enclosure means to the structural frame members of said unenclosed aerial platform imparts increased structural rigidity to the aerial platform frame with a minimal increase in total aerial platform weight, while at the same time providing utilitarian self-contained readily accessable implement and accessory storage compartments within said aerial platform.

3,917,027
SYSTEM FOR PRE-LUBRICATING AN OCCASIONALLY USED, FLUID CRANKED, QUICK STARTING, FUEL BURNING ENGINE

Alton L. Hakanson, and Wilbur C. Schafer, both of c/o Mar-Oil Hydraulics Inc., 113–115 Monroe St., Hoboken, N.J. 07030

Filed Dec. 14, 1973, Ser. No. 424,651
Int. Cl.² F02G *3/00*; **F01M** *1/00*
U.S. Cl. 184—6.3 **16 Claims**



1. In combination with an occasionally used, quick starting, fuel burning engine for driving an electric generator that powers an electric main, which engine has a lubricating system, and which has associated therewith a fluid energized rapid cranking system that includes

A. a fluid energizeable cranking motor,

B. a source of fluid under pressure,

C. a first conduit connecting the source of fluid under pressure to the cranking motor,

D. a normally closed valve in said conduit upstream of the cranking motor, and

E. means for opening the valve when the electric main is de-energized,

a pre-lubricating system that comprises:

I. a chamber storing lubricating liquid,

II. a second conduit connecting said chamber to the engine lubricating system,

III. a check valve in the second conduit that permits flow of lubricating liquid only toward the engine lubricating system,

IV. means for pressurizing the lubricating liquid in the chamber to force the liquid through the second conduit into the engine lubricating system, and

V. a third conduit connecting the first conduit downstream of the valve to the pressurizing means,

Vi. whereby when the valve is opened and fluid under pressure concurrently is applied to the cranking motor and to the pressurizing means, operation of the cranking motor will be deferred due to the inertia of the engine until the pressurizing means has completed a pre-lubricating cycle.

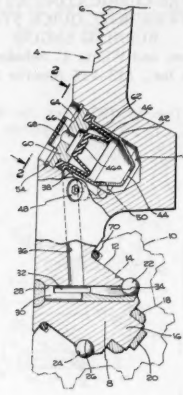
3,917,028
LUBRICATION RESERVOIR ASSEMBLY

Lloyd L. Garner, Los Alamitos, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Jan. 13, 1975, Ser. No. 540,316
Int. Cl.² E21B *9/08*
U.S. Cl. 184—6.14 **5 Claims**

1. In a lubrication system for earth boring tools wherein the body of the tool has a reservoir for a lubricant, a journal leg, a rotary cutter on said journal leg and defining therewith a lubrication space having a lubricant connection with said reservoir, an expansion device in said reservoir, a permanent removable closure plug for said reservoir extending a given

distance into the reservoir, and a temporary closure plug for the reservoir in place of the permanent plug and extending into the reservoir a greater distance than the permanent plug



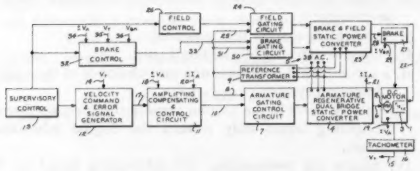
so that when the permanent plug is substituted for the temporary plug the reservoir is provided with a lubricant product expansion space therein.

3,917,029

TRANSPORTATION SYSTEM WITH BRAKE CONTROL AND COMBINED BRAKE AND FIELD POWER SUPPLY

John T. Maynard, New Berlin, Wis., assignor to Armor Elevator Company, Louisville, Ky.

Filed May 10, 1974, Ser. No. 468,875
Int. Cl.² B66B 1/32
U.S. Cl. 187—29 R **24 Claims**



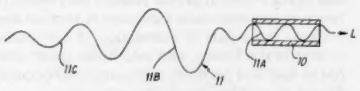
1. A transportation system having a guide path structure and a plurality of spaced landings and transportation means comprising a transport vehicle, means mounting said vehicle for movement relative to said structure in a path extending adjacent each of said landings, motive means providing an output and moving said vehicle relative to said structure, braking means including a friction braking element coupled to said output and operable between lifted and set conditions to selectively permit vehicle movement, and control means cooperating with said motive means and said braking means and controlling movement of said vehicle relative to the structure and stopping said vehicle at a selecting landing, said control means including brake control means connected to a source of energy and selectively supplying controlled amount of energy to said braking means, said brake control means including sensing means coupled to said braking means and providing a brake energy signal relating to the energy supplied to said braking means and command means providing a brake command signal commanding said braking element to operate to said lifted condition and output means controlling the amount of energy supplied from said source to said braking means in response to said command signal and said brake energy signal.

3,917,030

HIGH ENERGY ABSORBING COMPOSITE ARTICLES

John G. Morley, Little Eaton, and Robert S. Millman, Nottingham, both of England, assignors to National Research Development Corporation, London, England

Filed Jan. 24, 1973, Ser. No. 326,356
Claims priority, application United Kingdom, Jan. 28, 1972, 4061/72
Int. Cl.² F16F 7/12
U.S. Cl. 188—1 C **29 Claims**



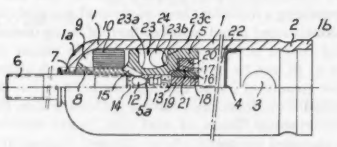
1. A stress limiting device comprising a plurality of parallel elements each including an outer member and an inner member, the inner member being of convoluted form and compressed by the outer member in a direction transverse to its length so that the peaks of the convolutions are in frictional contact with the associated outer member, the arrangement being such that as the inner member tends to straighten out the frictional contact between the peaks and the outer member is reduced, means for transmitting a force to the inner members in a direction which tends to straighten them, and means for transmitting an oppositely directed force to the outer members, transmission of such forces above a critical stress level causing the whole of each inner member to move bodily with respect to its associated outer member in the direction of the force applied to the inner member.

3,917,031

NOVEL PYROTECHNIC TENSIONING DEVICE FOR USE WITH SAFETY BELTS

Bernard J. Doin; Bernard E. Plantif, both of St. Medard en Jalles, and Jean F. Tillac, Bordeaux Cauderan, all of France, assignors to Societe Nationale des Poudres et Explosifs, Paris, France

Filed July 22, 1974, Ser. No. 490,382
Claims priority, application France, Aug. 3, 1973, 73.28506
Int. Cl.² F16F 7/12
U.S. Cl. 188—1 C **17 Claims**



1. A pyrotechnic tensioning device for use with a safety belt, comprising damping means comprising a cylinder having opposed ends, a piston slidably mounted within said cylinder, said cylinder and said piston having cooperating inner and outer surfaces, respectively, bottom and opposed side wall means defining an annular groove in the cooperating surface of one of said cylinder and said piston, said groove bottom wall having a conical bearing surface ending in one of said groove side walls which forms a path limiting stop, a circular row of elements located within the said groove, and having a radial dimension which is greater, by a predetermined amount, than the depth of the said groove adjacent the path limiting stop, whereby, in use, movement of the said piston relative to said cylinder in one direction of relative movement, is damped in a controlled manner by the said elements deforming or penetrating the said cooperating surface of the cylinder, said device further comprising a rod secured to said piston and projecting from one said end of said cylinder; a pyrotechnic charge positioned adjacent the said piston, and

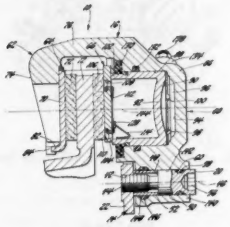
surrounding the said rod, so that firing of the said charge causes the piston to move in a first direction relative to the said cylinder; firing means for firing said pyrotechnic charge from externally of the said cylinder; and wherein the said damping means is arranged to damp movement of the piston relative to the cylinder in a direction opposite the said first direction, the said groove being located in the surface of the piston.

3,917,032

SINGLE MOUNT AND GUIDE PIN FOR A CALIPER OF A DISC BRAKE ASSEMBLY

Charles T. Hoffman, Jr., Dayton, and Edward H. Warwick, Englewood, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 11, 1974, Ser. No. 441,240
Int. Cl.² F16D *55/224*
U.S. Cl. 188—73.3 **2 Claims**



1. A sliding caliper mount for a disc brake, said mount comprising:
a caliper housing having a bore therethrough,
a caliper mounting member including a fixed support and a caliper mount and guide pin secured to said support and extending through said bore,
a first resilient bushing received in a groove formed in said bore adjacent one end thereof and supporting said pin in sliding and rotating relation,
a second resilient bushing received in a groove formed in said pin adjacent one end thereof and supporting said caliper housing at said bore in sliding and rotating relation,
said first and second bushings being relatively positioned so as to approach each other when the disc brake is actuated,
and means on said caliper and said fixed support for transmitting brake torque therebetween and limiting the rotational movements of said caliper housing about said pin.

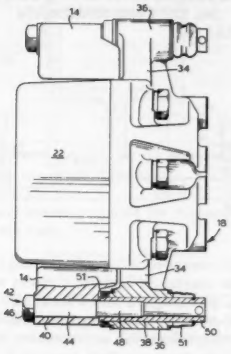
3,917,033

SLIDING CALIPER DISC BRAKES

Heinrich Bernard Rath, Koblenz-Luetzel, and Horst Willi Klassen, Sebastian, both of Germany, assignors to Girling Limited, Birmingham, England

Continuation of Ser. No. 231,913, March 6, 1972, abandoned. This application May 13, 1974, Ser. No. 469,600
Claims priority, application United Kingdom, Mar. 9, 1971, 6408/71; Mar. 9, 1971, 6409/71
Int. Cl.² F16D *65/02*
U.S. Cl. 188—73.3 **16 Claims**

1. A sliding caliper disc brake comprising a rotatable disc, a torque plate member for fixing to a vehicle frame or the like, a caliper member straddling a minor portion of the periphery of the disc for moving friction pad means disposed on opposite sides of the disc into braking engagement with the disc, portions of the torque plate member being arranged to receive directly drag forces experienced by each of the pad means, motor means in the caliper member for directly urging one pad means onto one side of the disc to cause the caliper member to slide relative to the torque plate member to apply by reaction the opposite pad means to the other side of the disc, and a sliding connection between the caliper member and the torque plate member comprising a first component slidably received in an opening in one of the members, a second component passing through an oversized opening in the other of said members and screw threadedly engaging said first component to releasably clamp the same against the other of said members, said oversized opening providing sufficient clearance for relative transverse movement between said second component and the other of said members.

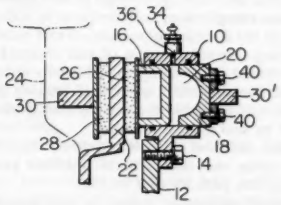


3,917,034

CLOSED LOOP TYPE DISC BRAKE ASSEMBLY

Kazuaki Shimizu, Yokosuka, Japan, assignor to Nissan Motor Company Limited, Yokohama, Japan

Filed May 6, 1974, Ser. No. 467,502
Claims priority, application Japan, May 7, 1973, 48-52625
Int. Cl.² F16D *55/228*
U.S. Cl. 188—73.4 **2 Claims**

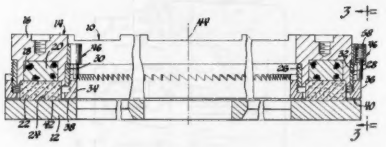


1. In a disc brake for wheeled vehicle including a rotatable brake disc, a stationary hydraulic cylinder having first and second pistons slidable in opposite directions which are substantially parallel to the axis of said brake disc, said pistons defining a fluid chamber therebetween into which pressurized fluid is supplied when a braking action is initiated, first and second brake pads positioned adjacent to opposite faces of said brake disc, said first brake pad being in abutting engagement with said first piston and thereby forced against said brake disc when said first piston is moved by said pressurized fluid, and a yoke being generally flat in shape and movable in a direction parallel to said axis of said brake disc by said second piston to move said second brake pad, the improvement in that said yoke has first and second flange portions at a portion thereof adapted to be contacted with a bottom outer face of said second piston, said first and second flange portions extending perpendicularly to and in opposite directions from the surface of the yoke and being symmetrically fixed to said bottom outer face by means of bolts.

3,917,035
ELECTRIC BRAKE ADJUSTER

Richard S. Grewette, Utica, and Edward J. Woods, Warren, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 18, 1975, Ser. No. 550,462
Int. Cl.[2] F16D 55/14, 65/54
U.S. Cl. 188—161 2 Claims



1. In an electro-magnetically actuated brake having a field coil, an annular magnet, a friction element secured to and extending from said magnet, and a forwardly and reversibly rotatable member to be braked by frictional engagement of said friction element therewith under a force depending upon the strength of the magnetic field generated in said magnet and said rotatable member by energization of said field coil, mechanism forming a magnetic flux path between said magnet and said rotatable member and including means adjusting said mechanism as said friction element wears to prevent braking force engagement between said mechanism and said rotatable member while permitting braking force engagement between said friction element and said rotatable member, said mechanism comprising:

first and second annular threaded sections respectively provided on the inner and outer peripheries of said annular magnet;

first and second annular magnet poles having threads thereon and threaded on said threaded sections for rotational movement relative to said annular magnet and resultant axial movement as said poles are threaded further onto said threaded section; said magnet poles having faces immediately adjacent said rotatable member and engageable therewith, upon wear of said friction element and brake energization, sufficiently to be rotated on said magnet in the direction of rotation of said rotatable member during forward rotation of said rotatable member, and by thread action being moved axially away from said rotatable member sufficiently that braking force is exerted on said rotatable member by said friction element and not by said magnet poles;

said magnet and said threaded sections thereof and said magnet poles and said rotatable member providing the magnetic flux path for said brake;

and selectively releasable means on said magnet and said magnet poles preventing rotation of said magnet poles upon engagement with said rotatable member during reverse rotation of said rotatable member.

3,917,036
MOLDED CAGE FOR AN OVERRUNNING ROLLER CLUTCH

Lawrence P. Johnson, Huron, and Oscar G. Kitchin, Port Clinton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 26, 1973, Ser. No. 427,903
Int. Cl.[2] F16D 15/00, 63/00
U.S. Cl. 192—45 4 Claims

1. A roller clutch cage comprising

a plurality of generally axial, circumferentially spaced cross bars having first and second axial end portions,

a plurality of first arcuate end segments alternately connecting said first and second axial end portions of adjacent cross bars,

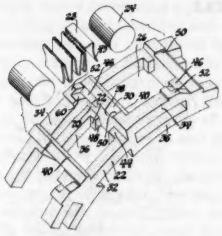
a plurality of second arcuate end segments alternately connecting said first and second axial end portions of adjacent cross bars,

said second arcuate end segments having an outer diameter no greater than the inner diameter of said first arcuate end segments,

said first and second arcuate end segments being connected to opposite axial end portions of adjacent cross bars and forming generally rectangular roller receiving pockets therewith,

a plurality of first ears projecting radially from a number of arcuate end segments connecting said first axial end portions, and

a plurality of second ears projecting radially from a number of arcuate end segments connecting said second axial end portions,



said first and second ears being integral with the same type of arcuate end segments and projecting away from the other type of arcuate end segments and having portions spaced radially from said cross bars whereby said cage is adapted to be molded in a two-part mold without any separate mold inserts and whereby said first and second ears are adapted to engage recessed surfaces in a cammed clutch race.

2. The cage as defined in claim 1 wherein said first ears are integral with a number of said first arcuate end segments connecting said first axial end portions, said second ears are integral with a like number of said first arcuate end segments connecting said second axial end portions and said first and second ears project radially outwardly from their respective arcuate end segments and have portions disposed radially outwardly of said cross bars.

3,917,037
BRAKE SYSTEM

Peter F. M. Prillinger, Peoria Heights, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 11, 1974, Ser. No. 522,393
Int. Cl.[2] F16D 65/24
U.S. Cl. 188—170 15 Claims

1. A brake system for stopping rotation of a pair of independently rotatable elements of a vehicle, comprising;

fluid applied brake means operatively associated with one of said rotatable elements;

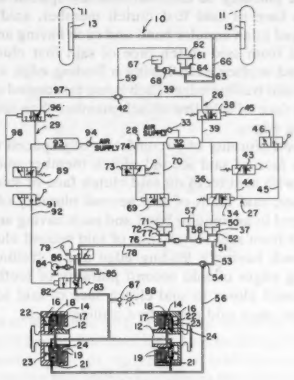
spring applied, fluid released brake means operatively associated with the other of said rotatable elements;

apparatus means for providing pressurized fluid;

conduit means connecting said apparatus means to both of said brake means; and

valve means disposed in said conduit means and normally positioned to direct said pressurized fluid to said spring applied fluid released brake means while blocking fluid flow therethrough to the fluid applied brake means for releasing both of said brake means permitting unrestricted rotation of said elements, said valve means being selectively positionable simultaneously to block fluid flow therethrough to said spring applied fluid released brake

means and to direct pressurized fluid to said fluid applied brake means so that both of said brake means are applied

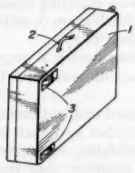


at the same time for stopping rotation of said rotatable elements.

3,917,038
MOBILE SUITCASE

Helga Helene Føge, Agnetevej 20, 2800, Lyngby, and Hans Thomas Thomsen, Friisvej 10, 2670, Greve Strand, both of Denmark

Filed Nov. 12, 1973, Ser. No. 414,726
Claims priority, application Denmark, Nov. 13, 1972, 5631/72; Apr. 6, 1973, 1872/73
Int. Cl. A45c *5/14*
U.S. Cl. 190—18 A **11 Claims**



10. A suitcase assembly according to claim **9** in which said second slot means is defined by a pair of prongs, one prong being shorter than the other to facilitate engagement with and disengagement from said first pivot pin.

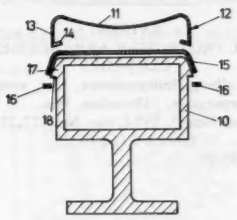
3,917,039
CONDUCTOR RAIL

Alexander Maitland, Schaffhausen, Switzerland, assignor to Swiss Aluminium Ltd., Neuhausen am Rheinfall, Switzerland

Filed Mar. 15, 1973, Ser. No. 341,345
Claims priority, application Switzerland, Mar. 17, 1972, 4031/72
Int. Cl.² B60M *1/30*
U.S. Cl. 191/29DM **6 Claims**

1. A substantially inflexible conductor rail for current supply to a pick-up in a rail vehicle, the conductor rail comprising a substantially inflexible body, composed of material which is a good electrical conductor,

a facing composed of material resistant to wear, for engagement by the pick-up, and

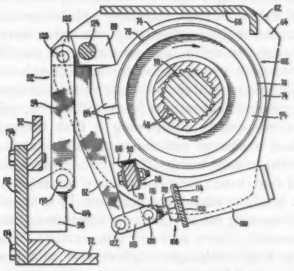


resilient clamp means operable for releasably securing the facing to the body.

3,917,040
TRANSMISSION CONTROLLED VEHICLE BRAKE

Stanley L. Radcliffe, Stow, Ohio, and Arthur E. Dornan, Ann Arbor, Mich., assignors to Massey-Ferguson Inc., Detroit, Mich.

Division of Ser. No. 227,836, Feb. 22, 1972, Pat. No. 3,819,016. This application May 18, 1973, Ser. No. 361,713
Int. Cl.² B60K *29/02*
U.S. Cl. 192—4 A **9 Claims**



1. In a vehicle having a transmission and a drive member for transmitting power to ground engaging members from an engine for driving the vehicle relative to the ground, a braking system comprising,

means for interrupting movement of the drive member mounted on the drive member;

a linkage operatively associated with said interrupting means, a member of said linkage supported by the drive member so as to be rotatable over a portion of the 360° rotation of the drive member in response to reverse motion of the drive member corresponding to reverse motion of the vehicle, said linkage including a link and a pivotal arm, two ends on said pivotal arm with one end of said pivotal arm being pivotally connected to said linkage and to said link at spaced locations, said link limiting the rotational movement of said linkage member;

means for operatively engaging said linkage, having at least a portion thereof stationary for engaging said link, to cause said linkage to energize said interrupting means preventing further movement of the drive member;

means for shifting the transmission;

means for actuating said linkage attached to the other end of said pivotal arm;

means for controlling said system including a first control element and a second control element responsive to reverse motion of the drive member;

a second linkage between said shifting means and said control means attached to said first control element to posi-

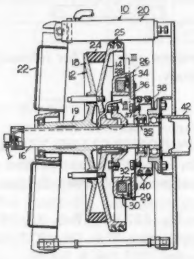
tion said element, said second control element directing the flow of energy to said actuating means upon reverse motion of the drive member.

3,917,041

THERMAL PROTECTIVE ARRANGEMENT FOR CLUTCHES

Maynard E. Walberg, Independence, Mo., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed June 7, 1974, Ser. No. 477,275
Int. Cl. F16d *43/25*
U.S. Cl. 192—30 W **12 Claims**



1. In combination, a clutch comprising a driving clutch member and a driven clutch member, said driven clutch member being clutchingly engageable with said driving clutch member whereby to drive said driven clutch member, and a thermal protective arrangement for said clutch whereby to effect declutching of said driven clutch member upon sensing of a predetermined heat output from said clutch, said thermal protective arrangement comprising a first thermal sensing means in heat exchange relation with said clutch, said first thermal sensing means being effective to cause a declutching operation of said driven member relative to said driving member when a predetermined temperature T_2 is sensed by said first thermal sensing means, said predetermined temperature being substantially above ambient temperature, heater means positioned in heat exchange relation with said first thermal sensing means, said heater means being effective to normally maintain the temperature in the region of said first thermal sensing means substantially at some biasing temperature value T_1 which is substantially ΔT degrees below said predetermined temperature T_2, whereby a heat input to said first thermal sensing means from said clutch of substantially only ΔT degrees is necessary to cause said first thermal sensing means to effectuate a declutching operation.

3,917,042

MAGNETIC CLUTCH

Hubert Wayne Summa, 4200 Dr. Greaves Road, Grandview, Mo. 64030

Filed Apr. 29, 1974, Ser. No. 465,180
Int. Cl.² F16D *19/00*
U.S. Cl. 192—84 A **3 Claims**

1. A magnetic clutch comprising:

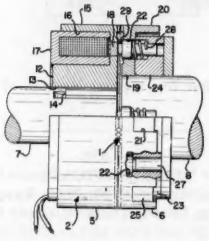
a. a rotatably mounted driving member and a rotatably mounted driven member positioned in substantial coaxial longitudinal alignment one with the other;

b. a first clutch member operatively mounted on said driving member and rotatable therewith, said first clutch member having a clutch face positioned substantially normal to a longitudinal axis of said driving member;

c. a second clutch member operatively mounted on said driven member and rotatable therewith, said second clutch member having a clutch face positioned substantially normal to a longitudinal axis of said driven member, said clutch face of said second clutch member being in facing relation with said clutch face of said first clutch member, said second clutch member being mounted for selective movement of said clutch face thereof toward and away from said clutch face of said first clutch member;

d. a first plurality of circumferentially spaced teeth on said clutch face of said first clutch member, said teeth being arranged in an annular band and each having an end surface spaced from said clutch face of said first clutch member, said end surface each having a leading edge and a trailing edge, said trailing edges each being positioned closer to said clutch face of said first clutch member than said respective leading edges;

e. a second plurality of circumferentially spaced teeth on said clutch face of said second clutch member and adapted to mesh with said teeth on said clutch face of said first clutch member, said teeth of said second plurality of teeth being arranged in an annular band and each having an end surface spaced from said clutch face of said second clutch member and each having a leading edge and a trailing edge, said leading edges of said second plurality of teeth each being positioned closer to said clutch face of said second clutch member than said respective trailing edges;



f. electro-magnetic means associated with each of said first clutch member and said second clutch member for selectively effecting meshing engagement between said first and second plurality of teeth;

g. means associated with each of said first clutch member and said clutch member for effecting separation of said first and second plurality of teeth upon deactivation of said electro-magnetic means comprising:

1. an annular member having a wear face positioned substantially coplanar with said clutch face of said first clutch member; and

2. a plurality of spaced resilient members mounted on said second clutch member and each having an end portion positioned to be in sliding engagement with said wear face of said annular member, said resilient members each being adapted to urge said clutch face of said second clutch member away from said clutch face of said first clutch member and being adapted to resist movement of said clutch face of said second clutch member toward said clutch face of said first clutch member until overcome by activation of said electro-magnetic means for effecting meshing engagement between said first and second plurality of teeth.

3,917,043

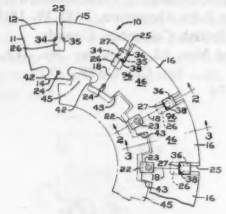
FRICTION DISC MEMBER FOR BRAKE OR CLUTCH

Lowell D. Bok, Anna, Ohio, assignor to The B.F. Goodrich Company, Akron, Ohio

Filed June 17, 1974, Ser. No. 480,113
Int. Cl.² F16D *13/60*
U.S. Cl. 192—107 R **16 Claims**

2. A friction member for a brake or clutch comprising an annular rigid disc member, sector-shaped friction lining segments positioned on the face of said disc member and spaced circumferentially around said disc member, said disc member having a peripheral edge and slots extending radially of said

annular disc member from said edge into the body of said disc member, block members in said slots, said lining segments having radially extending edges, recesses located in said radially extending edges, said segments being positioned in side-by-side relationship with said recesses of adjacent segments



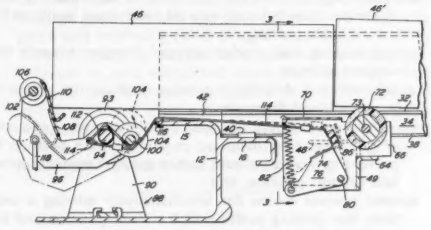
positioned over said slots and said lining segments and said block members having interlocking edges including the edges of said recesses to prevent movement of said block members in said slots and to transmit torque forces through said block members from said segments to said disc member.

3,917,044

LANE BRAKE ASSEMBLY

William L. Brown, Easton, Pa., assignor to SI Handling Systems, Inc., Easton, Pa.

Filed Apr. 3, 1974, Ser. No. 457,688
Int. Cl.² B65G *11/20*
U.S. Cl. 193—40 **7 Claims**



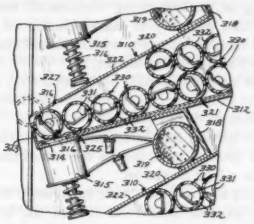
1. Apparatus comprising means defining an inclined lane having sides and a discharge end along which containers are to be located for singular discharge at said end, said lane including at least two runners for contact with containers in said lane, means defining a support for said runners, a release mechanism at the discharge end of said lane, said mechanism being movable from a blocking position to a release position, a brake means positioned upstream from said mechanism for selectively retarding movement of a second container in the lane when said release mechanism is in its release position, said brake means including a roller mounted between said runners for rotation about its longitudinal axis, the upper surface of said roller being at an elevation above the elevation of an adjacent portion of said runners, a brake pad mounted for pivotable movement toward and away from said roller, spring means biasing said pad toward said roller for contact therewith, a flexible wire-like member extending between said release mechanism and said brake pad, said wire-like member being responsive to movement of said release mechanism so that said brake pad is ineffective when the release mechanism is in a blocking position and the brake pad applies a braking force under the bias of said spring means to prevent rotation of said roller when the release mechanism is in its release position.

3,917,045

DRUG DISPENSING APPARATUS

Robert L. Williams, 4354 Meadowwood Drive, and George Dunham, Rte. 4, Box 1006, both of Rapid City, S. Dak. 57701

Filed Apr. 25, 1974, Ser. No. 463,999
Int. Cl.² G07F *7/02*
U.S. Cl. 194—4 C **33 Claims**



1. Apparatus for automatically dispensing one or a plurality of single drug doses in response to input information representing unique medicinal needs of a patient, comprising:

a. a cabinet defining an internal cavity with cartridge supporting members disposed therein for slidably accepting and retaining a plurality of cartridge means;

b. a plurality of refillable cartridge magazine means removably mounted in side-by-side alignment within said cabinet upon said cartridge supporting members for holding and dispensing individual drug doses, each of said cartridge magazine means being disjunct from but slidably mounted for rapid replacement upon said cartridge supporting members, wherein each cartridge means comprises:

i. a housing defining an outlet;

ii. means in said housing for storing a plurality of single drug doses;

iii. means for effecting movement of said single drug doses toward said housing outlet in sequential order; and

iv. means for dispensing said single drug doses from said housing outlet, one at a time;

c. information input receptor means for receiving said input information; and

d. control means operatively connected with said plurality of said cartridge means and with said information input means for automatically sequentially operating selected ones of said plurality of cartridge means in response to a single entry of said received input information to dispense said single drug doses from those ones of said plurality of cartridge means which will satisfy said unique medicinal needs of a a patient, wherein said unique medicinal patient needs may comprise those single drug doses prescribed to be administered to a patient at a specified time of the day.

3,917,046

RENTAL LOCKER SYSTEM

Kazumi Yorisue, and Mitsuhiro Akamatsu, both of Himeji, Japan, assignors to Glory Kogyo Kabushiki Kaisha, Japan

Continuation of Ser. No. 197,068, Nov. 9, 1971, abandoned. This application Dec. 5, 1973, Ser. No. 422,081
Claims priority, application Japan, Nov. 10, 1970, 45-98903
Int. Cl.² G07F *17/12*
U.S. Cl. 194—9 T **3 Claims**

1. A rental locker system which is rendered lockable with a locker key after dropping an indicated required number of coins into a coin inlet slot of the system and unlockable with the same key during a predetermined period of time thereafter, said system comprising:

locking means operatively responsive to the insertion of the locker key therein for locking and unlocking the system;

preventing means operatively associated with said locking means for preventing locking and unlocking thereof by the locker key;

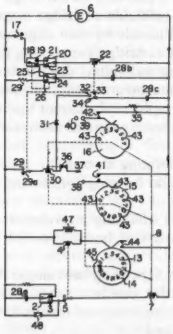
electrically operable releasing means for releasing said preventing means and thus permitting locking and unlocking of said locking means;

first cam means having a plurality of indicator marks for indicating at an indicating window of the system that mark of said plurality of marks chosen to represent the required number of coins which permit locking and unlocking of said locking means;

second cam means rotatably associated with said first cam means for positioning at least said that mark at the indicating window of the system;

first electric driving means operatively associated with said first and second cam means for simultaneous rotation thereof in a first direction;

first detecting means operatively responsive to the dropping of coins into the coin inlet slot of the system and for actuably causing said first electric driving means to correspondingly rotate said first and second cam means in said first direction whereby when the locker system in an unused state is to be engaged by a user successive ones of said indication marks are obtainable at the indicating window until a completion mark is obtained thereat indicating that no more coins are necessary whereupon said



preventing means is released by said releasing means and said locking means may be locked;

second electric driving means operatively associated with said first and second cam means for simultaneous rotation thereof in a second direction;

locking and unlocking detecting switching means for detecting locking and unlocking movements of said locking means and operating to cause said second electric driving means to rotate said first and second cam means in said second direction whereby when a user of the system unlocks said locking means within said predetermined period of time said that mark reappears at the indication window;

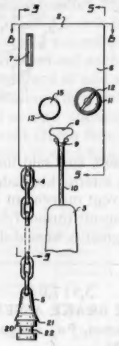
switching means responsive to the lapse of time and operatively associated with said locking and unlocking means and said second electric driving means, whereby if the user of the system does not unlock said locking means within said predetermined period of time, said switching means actuably operates to cause said first and second cams to be rotated in said second direction by said second electric drive means so that successive multiples of said that mark appear at the indicating window after the lapse of each further successive ones of said predetermined periods of time and said preventing means prevents unlocking of said locking means until the user deposits a number of coins in the coin inlet slot of the system represented by the final multiple mark reached in the indicating window.

3,917,047

COIN PRIMED DEVICE FOR CHECKING AND SUPPORTING AN ARTICLE

Charles William Cawthorne, 1325 Madison Ave., North Burnaby, and Ian John Abramson, 3485 W. 15th Ave., Vancouver, both of British Columbia, Canada

Filed Nov. 12, 1973, Ser. No. 415,235
Int. Cl.² G07F *5/00*
U.S. Cl. 194—74 **15 Claims**



1. A coin primed device for checking and supporting an article on a detachable carrier comprising:

a frame structure,

a carrier support member mounted for movement in said frame structure between support and release positions for a detachable carrier,

means biasing said carrier support member towards the support position,

a coin receiver defining a priming position for a coin of predetermined diameter,

primary control means responsive to the reception of a coin of predetermined diameter in said priming position to prevent movement of said carrier support member out of said support position, and

second control means for simultaneously moving a coin from the priming position to a release position and for latching said carrier support member in the support position.

3,917,048

SYNCHRONIZED LINE FEED TENSIONING AND GRIPPING APPARATUS FOR PRINTER

Arthur F. Riley, Chicago, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Dec. 12, 1974, Ser. No. 531,955
Int. Cl.² B41J *15/04, 15/16*
U.S. Cl. 197—133 P **13 Claims**

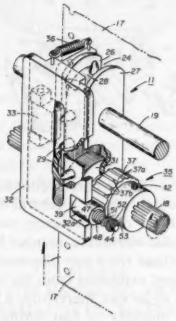
10. In a printer including a type character print mechanism and a line feed mechanism for alternately advancing a web at least one predetermined line space at a time, and for stopping the web for a predetermined line printing period, with both normally occurring in a relatively rapid, repetitive manner, the combination further comprising:

an assembly for applying adjustable tension on said web while being advanced, and for firmly gripping and holding said web in a fixed position under tension during each line printing period, said assembly including:

a pair of rotatable pinch cams coupled to and rotated in response to the actuation of said line feed mechanism, said pinch cams being spaced apart so as to be respectively positioned near the opposite longitudinal edges of

said web in the immediate area of said print mechanism, said pinch cams each having a plurality of spaced protuberances with arcuate peripheral wall portions, each having a common maximum radius, with adjacent protuberances being separated by arcuate recesses so as to define a scalloped periphery, each of said pinch cams being positioned adjacent to said web such that the arcuate peripheral wall portion of at least one protuberance thereof contacts one side of said web and moves in the same direction as said web when said web is moving:

means for causing the time of periodic contact of said at least one protuberance to coincide with said predetermined period, and



a pair of rotatable pinch and tensioning rollers, each having at least a resilient peripheral surface, respectively positioned in contact with the side of said web opposite a different one of said pinch cams, and being in alignment with the latter, the axis and dimensions of each rotatable pinch and tensioning roller being chosen relative to both the axis of, and the dimensions of said recesses and protuberances in, said associated pinch cam such that when each successive arcuate peripheral wall portion of said associated pinch cam is rotated at least into its closest proximity with said aligned pinch and tensioning roller, defined by a plane bisecting the axes thereof, said web is firmly gripped under tension therebetween.

3,917,049

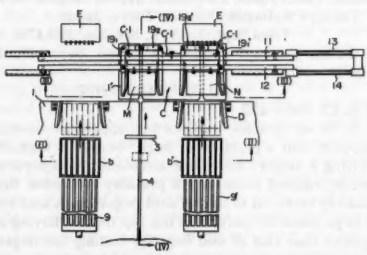
CIGARETTE FORWARDING APPARATUS

Haruji Shirai; Hisamitu Ishihara, both of Tokyo, and Taizo Ogata, Kashiwa, all of Japan, assignors to Tokyo Automatic Machineryworks Ltd., Tokyo, Japan

Filed Sept. 12, 1973, Ser. No. 396,473

Int. Cl.[2] B65G *47/10*

U.S. Cl. 198—32 **5 Claims**



1. An apparatus for advancing cigarettes comprising:

a passageway extending in a first direction for receiving pluralities of cigarettes;

a pair of hoppers for dispensing cigarettes, said hoppers positioned on opposite sides of the passageway;

a pair of channels spaced from one another, each having movable walls extending generally in the direction of said passageway, defining an inlet and an outlet end for each of said channels;

a reciprocating frame for mounting said channels;

means for moving said frame to align one of the channels with said hopper while aligning the other of said channels with said passageway;

first pushing means associated with each hopper for pushing cigarettes from beneath said hopper into the inlet of the channel aligned therewith;

second pushing means aligned with said passageway for pushing cigarettes out through the outlet of that channel aligned with the passageway and along the passageway; and

means for moving at least one of the walls associated with each channel to compress slightly cigarettes in the channels before the cigarettes are pushed out of the outlets of the channels, said moving means thereafter spreading the walls of the channels to facilitate pushing cigarettes into the channels when the channels are aligned with the hopper, wherein said moving means includes:

means pivoting the walls to the reciprocating frame at locations adjacent to the outlets of the channels; and

means for shifting the walls to rotate about said pivots to thereby spread the walls at the outlets of the channels to receive the cigarettes and move the walls toward one another to compress the cigarettes.

3,917,050

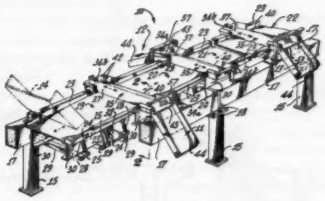
DISTRIBUTOR WITH DISCHARGE CONVEYORS

Vaughn Gregor, 465 Castle Place, Beverly Hills, Calif. 90210

Filed Feb. 28, 1974, Ser. No. 446,599

Int. Cl.[2] B65G *43/08*

U.S. Cl. 198—37 **22 Claims**



1. In a distributor system for conveying material from a source to a plurality of use points spaced apart along a predetermined path, and including:

a plurality of longitudinally extending vibratory conveyor sections arranged in end-to-end relation along said path and each including a tray supported for longitudinal vibratory movement, said use points being located adjacent the downstream end of the tray;

power-operated means for vibrating each of said trays independently of the other trays, longitudinally of said path, to advance material thereon along said path from the upstream end of the conveyor section along the tray toward a use point and toward the next downstream conveyor section; and

sensor means for monitoring the quantity of material available for delivery to each use point and controlling the power-operated vibrating means of the adjacent upstream tray to move material thereon downstream along the tray

when the quantity of material at the use point is below a selected level;

the improvement which comprises:

transversely extending vibratory discharge conveyors positioned at the downstream ends of said trays to receive material from the next upstream trays, said vibratory discharge conveyors having conveying surfaces extending longitudinally of said path to convey material between adjacent trays, and also extending transversely of said path to discharge material therefrom;

means supporting said vibratory discharge conveyors on said conveyor sections for longitudinal vibratory movement with the adjacent downstream trays, to advance material longitudinally of said path across each of said conveying surfaces when the adjacent downstream tray is being vibrated by said power-operated means, whereby said conveying surfaces constitute extensions of said trays and define portions of said path;

means supporting said conveying surfaces on said conveyor sections for vibratory movement transversely of said path relative to said conveyor sections; and

selectively operable means for vibrating each of said conveying surfaces, transversely of said path and relative to the conveyor section upon which it is supported, to discharge material laterally from said distributor system at said use points, said selectively operable means being carried by said conveyor sections for longitudinal vibration with the trays thereof.

3,917,051

UNLOADING DEVICE WITH A VERTICAL CONVEYOR

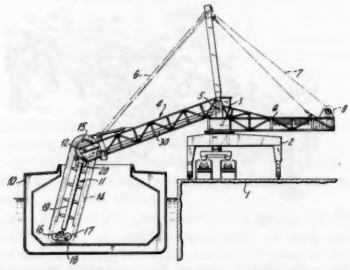
Pieter Pennings, and Gerhard Scholler, both of Bad Schwartau, Germany, assignors to Orenstein & Koppel AG, Luebeck, Germany

Filed Sept. 18, 1974, Ser. No. 507,055

Claims priority, application Germany, Oct. 5, 1973, 2350097; May 3, 1974, 2421374

Int. Cl.² B65G 63/00

U.S. Cl. 198—91 **15 Claims**



1. An unloading device, comprising a support jib having an outer end with a vertical conveyor support member, a roller bearing assembly supported on said support member, a vertical conveyor including a vertical conveyor support arm pivoted on said support member, conveyor guide roller means on said support arm, a conveyor return wheel supported on said roller bearing assembly for rotative movement, and an endless conveyor member engaged over said return wheel and said guide roller means; said bearing assembly including a middle ring and an outer ring around said middle ring, and an inner ring within said outer ring, all relatively rotatable in respect to each other, an annular gear carried by one of said outer and inner rings and connected to said return wheel, and at least one drive motor having a drive gear connected to said annular gear and supported in a position adjacent said annular gear for driving said gear and said return wheel.

3,917,052

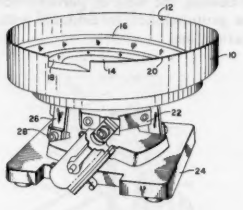
METHOD AND APPARATUS FOR BALANCING ASYMMETRIC WEIGHTS IN A VIBRATORY CONVEYOR

Warren C. Burgess, Jr., Avon Lake, Ohio, assignor to Burgess & Associates, Incorporated, Cleveland, Ohio

Continuation-in-part of Ser. No. 312,582, Dec. 6, 1972, abandoned. This application July 19, 1974, Ser. No. 489,990

Int. Cl.² B65G 27/00

U.S. Cl. 198—220 BC **7 Claims**



1. In a vibratory bowl-type parts feeder having an asymmetric distribution of weight about a central drive axis and normally nonuniform transit of parts therein, said feeder comprising a generally circular vibratable member having an upstanding wall and an inclined trackway disposed around the inner surface of the wall and extending from the bottom of the bowl generally upwardly to an exit therefrom; a base; and resilient means including a plurality of leaf spring stations disposed about said central drive axis in which the leaf springs are inclined at a predetermined angle, the ends of said springs being rigidly fixed, respectively, to said vibratable member and said base; a primary force generating member having a straight line axis of oscillation lying in a plane normal to a radius extending from said central drive axis for inducing vibration of said vibratable member; and means for supporting said primary force generating member in spaced relation to said central drive axis; the improvement of which comprises in combination therewith, means for angularly adjusting the path of said straight line axis of oscillation within said plane and means for setting said primary force generating member at the adjusted angle,

whereby the direction of the force vector generated by said primary force generating member and directed to said vibratable member closely approaches balance of the asymmetric inertia caused by said asymmetric distribution of weight and the character of transport of parts is rendered more nearly uniform in the various sectors of said trackway.

3,917,053

INTERLOCKING DEVICE FOR ARTICLE TRANSPORTER HAVING PUSHER FINGERS

Selichi Matsuyama, Hiroshima, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 7, 1973, Ser. No. 395,170

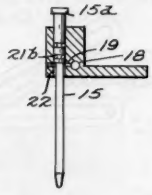
Claims priority, application Japan, Sept. 13, 1972, 47-10609

Int. Cl.² B65G 43/02

U.S. Cl. 198—232 **1 Claim**

1. In an articles transporting apparatus having a finger support with a plurality of finger bores for each slidably receiving a finger, means for circulating said support along a predetermined route and a plurality of pusher fingers each slidably received in one of said finger bores and each having a large diameter portion at the top thereof having a diameter greater than that of said bore for holding the finger in place, each said finger engaging said articles whereby the articles delivered successively in several rows by a conveyor means are divided into groups each of a predetermined number of articles by said pusher fingers and further transported, the

improvement wherein said finger support has formed therein substantially along its full length a pressurized fluid supply bore connected to a pressurized fluid source, further bores connecting said supply bore to said finger bores the portion of each finger remote from said large diameter portion forming a path to the atmosphere from said further bore when that



portion is adjacent the further bore opening into the finger bore to produce a detection signal indicating improper engagement of an article and a portion between said remote portion and said large diameter portion blocking flow of said pressurized fluid when that portion is adjacent the further bore opening.

3,917,054

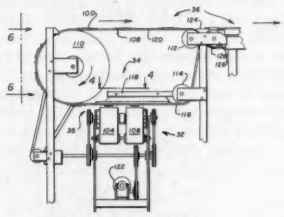
METHOD FOR HANDLING ARTICLES OF PARAMAGNETIC MATERIAL

Robert L. Hurst, Muncie, Ind., assignor to Ball Corporation, Muncie, Ind.

Division of Ser. No. 99,485, Dec. 18, 1970, Pat. No. 3,712,450, which is a division of Ser. No. 784,845, Dec. 18, 1968, Pat. No. 3,641,959. This application Dec. 20, 1972, Ser. No. 316,952

Int. Cl.[2] B65G 47/24

U.S. Cl. 198—266 **2 Claims**



1. A method of moving articles of paramagnetic material from one location to another and inverting the articles during such movement, comprising: establishing a transfer zone; creating a first, stationary, magnetic field at said transfer zone; creating a second, movable, magnetic field at said transfer zone adjacent to said first field; establishing a dual path of travel from the selected location to the transfer zone; sequentially moving a plurality of said articles along both components of said dual path to deliver a pair of articles, in side-by-side relation, simultaneously to the transfer zone; simultaneously subjecting said pair of articles to the first magnetic field and moving said articles in single file along a new path lateral to the dual path; continuing to move said articles along the new path out of said first field and into said second field; rotating said second magnetic field about a horizontal axis to restrain said article to movement in the new path through a vertical arc of about 180°; and sequentially repeating the transfer process with each succeeding pair of articles to establish a continuous single file of articles traveling along said new path.

3,917,055

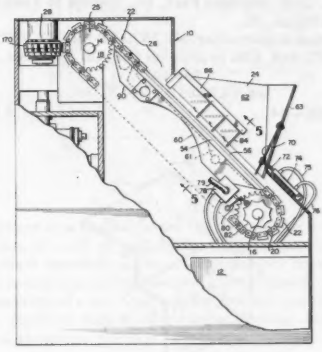
CAPSULE RECTIFICATION APPARATUS

Willard J. VandenBerg; Robert E. Ramsey, both of Indianapolis; Robert L. Bollman, Mooresville; Richard E. Krackenberger, Beech Groove, and George Pieczko, Indianapolis, all of Ind., assignors to Eli Lilly & Company, Indianapolis, Ind.

Filed Jan. 7, 1974, Ser. No. 431,116

Int. Cl.[2] B65G 47/24

U.S. Cl. 198—278 **18 Claims**



1. Apparatus for handling medicinal capsules or the like to present the same successively in uniform endwise orientation, comprising rectification,

a conveyor forming a series of spaced cavities having capsule receiving portions for conveying capsules endwise along a conveyor path, each such receiving portion being shaped to loosely confine an individual capsule therein and being open at one side for purposes of rectification. means forming at said one side a deep rectifying slot defined at its entrance by spaced side shoulders on and moving with the conveyor, the slot width and shoulder spacing being such as to pass the body of a capsule but retain the cap thereof,

said slot having a depth beyond said shoulders sufficient to substantially contain therein the projecting body of an upstanding capsule supported at its cap edges by said shoulders,

the conveyor having a longitudinal rail slot centrally of such rectifying slot for the reception of a cam rail,

a cam rail extending over a portion of the conveyor path, received in said rail slot, and having a capsule-engaging edge presented toward the capsule receiving portions of said cavities to support capsules in endwise orientation therein over said portion of the conveyor path,

said rail having an abrupt terminus at a rectifying position, so arranged that at an intermediate position of travel across said terminus a body-forward capsule will have its rear cap end supported by the cam rail and its forward body end projecting unsupported beyond said terminus, said capsule-engaging rail face having an elevation immediately ahead of said terminus to support the capsule with its sides spaced from said shoulders of the rectifying slot to permit at least partial tilting of a body-forward capsule about the terminus before the cap thereof engages said shoulders,

means at the rectifying position to induce airflow through the rectifying slot against the unsupported capsule end for positively urging the capsule to tilt about said terminus toward a cap-forward position,

a secondary cam rail positioned to enter said rail slot as the cavities are carried beyond said terminus and having a camming surface to engage the lower end of a partially tilted capsule to cam the same toward the capsule-receiving portion of the cavity,

and means to induce airflow through the cavities and rectifying slots as the same traverse said secondary cam rail to cause the capsules engaged by such camming surface to be retained and to tilt to a cap-forward endwise position in the capsule-receiving portions of the cavities.

3,917,056

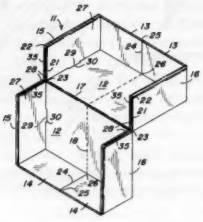
PIVOTALLY ARTICULATED CONTAINER WITH CROSSED FOLDS

Ronald H. Taub, Highland Park, Ill., assignor to Taub Family Trust, Chicago, Ill.

Continuation-in-part of Ser. No. 307,449, Nov. 17, 1972, Pat. No. 3,872,965. This application Dec. 18, 1974, Ser. No. 534,142

Int. Cl.² B65D *5/48, 81/36*

U.S. Cl. 206—44 **4 Claims**



1. In a shipping and display container adapted to hold a multiplicity of packages in an organized array, said container comprising a pair of opposed side walls, a pair of opposed end walls, and a uniplanar floor joined to said side walls and said end walls, the improvement wherein:

a. said floor is formed with a first fold line extending laterally thereacross between said side walls and a second fold line extending longitudinally thereacross between said end walls to provide four floor-joined, pivotally articulated sections connected along the fold lines in said floor;

b. said side walls are formed with opposed, generally vertically directed slits extending from upper edges of respective said side walls downwardly to said floor at said first fold line to divide each of said side walls into two distinct panels, whereby said floor is adapted for unrestricted hinged arcuate movement downwardly about said first fold line; and

c. said end walls are formed with opposed, generally vertically directed slits extending from upper edges of respective said end walls downwardly to said floor at said second fold line to divide each of said end walls into two distinct panels, whereby said floor is also adapted for unrestricted hinged arcuate movement downwardly about said second fold line;

each said sections being adapted to hold a row of articles extending thereacross, whereby upon pivotal shifting of said sections about either of said first and second fold lines in said floor to open said slits in said walls, panels of any articles contained in respective said sections are exposed and rendered readily accessible for application of price marking indicia thereto.

3,917,057

MATCHBOOK WITH COVER LOCKING MEANS

Gennaro J. Bruzzano, 1225 Douglas Ave., North Brunswick, N.J. 08902

Continuation-in-part of Ser. No. 453,673, March 22, 1974, abandoned. This application Feb. 5, 1975, Ser. No. 547,123

Int. Cl.² A24F *27/12*

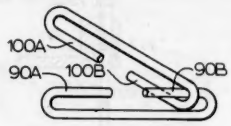
U.S. Cl. 206—104 **9 Claims**

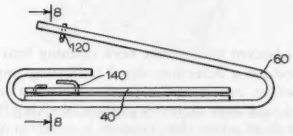
1. A matchbook comprising

a sheet having a base portion and a flexible cover adapted to be folded over said base portion, said cover having a lower surface,

a matrix of matches disposed on said base portion and secured thereto, said matrix having a top surface,

a first locking member secured to said matrix and including a leg positioned adjacent to said top surface of said matrix facing said bottom surface of said cover, and





a second locking member secured to said cover and including a leg positioned below and adjacent to said bottom surface of said cover facing said matrix, said legs of said first and second locking members being oriented at an angle to each other so that, when said cover is set in place over said matrix, said legs engage each other and lock said cover in place.

3,917,058

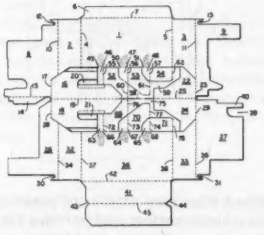
ARTICLE CARRIER

Prentice J. Wood, Jonesboro, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Feb. 28, 1974, Ser. No. 447,012

Int. Cl.² B65D *75/00*

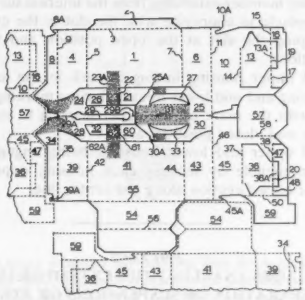
U.S. Cl. 206—181 **4 Claims**



1. An article carrier comprising a bottom wall, side walls foldably joined to the side edges of said bottom wall, end wall panels foldably joined to the end edges of said side walls and extending inwardly therefrom, medial partition handle structure including a medial panel foldably joined at its outer end to the inner edge of each of said end wall panels, a plurality of spaced apart anchoring tabs foldably joined to the top edges of each side wall and secured in flat face contacting relation to the inner surfaces thereof, a plurality of partition strips foldably joined respectively at their outer ends to said anchoring tabs, and a common anchoring panel foldably joined to the inner ends of said partition strips on each side of said medial partition handle structure and one of said common anchoring panels being secured in flat face contacting relation to two of said medial panels at opposite ends of the carrier respectively, said two medial panels being foldably joined to end wall panels

which are disposed on opposite sides of said medial partition handle structure.

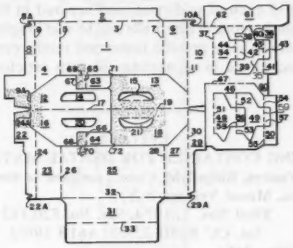
3,917,059
ARTICLE CARRIER
Prentice J. Wood, Jonesboro, Ga., assignor to The Mead Corporation, Dayton, Ohio
Filed Oct. 31, 1973, Ser. No. 411,507
Int. Cl.² B65D *75/00*
U.S. Cl. 206—187 **7 Claims**



1. An article carrier comprising a bottom wall, side walls foldably joined to the side edges of said bottom wall, end wall panels foldably joined to the end edges of said side walls and extending inwardly therefrom, a multiple-ply handle comprising at least one pair of handle panels, medial partition structure including a pair of medial panels foldably joined respectively to said end wall panels at one end of the carrier along the edges thereof remote from said side walls and extending medially inward of the carrier, riser panels foldably joined respectively to said end wall panels at the other end of the carrier along the edges thereof remote from said side walls and extending medially inward of the carrier, a first medial partition panel struck from said medial partition structure and foldably joined to only one of said medial panels and folded into flat face contacting relation therewith, a second medial partition panel foldably joined to said one of said medial panels and affixed in flat face contacting relation to said first medial partition panel and one of said medial partition panels being secured to at least one of said riser panels.

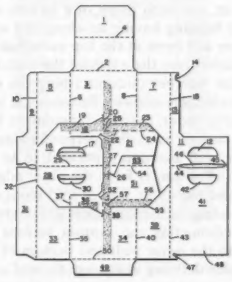
3,917,060
ARTICLE CARRIER
Prentice J. Wood, Jonesboro, Ga., assignor to The Mead Corporation, Dayton, Ohio
Filed July 22, 1974, Ser. No. 491,153
Int. Cl.² B65D *75/00*
U.S. Cl. 206—187 **2 Claims**

1. An article carrier blank comprising a bottom wall, a first side wall foldably joined to a side edge of said bottom wall, a first pair of end wall panels foldably joined respectively to the end edges of said first side wall, a pair of riser panels foldably joined respectively to said first pair of end wall panels along the edges thereof remote from said first side wall, a first pair of handle panels foldably joined respectively to said pair of riser panels, a second pair of handle panels foldably joined respectively to the top edges of said first pair of handle panels, a third riser panel foldably joined to one of said second pair of handle panels along an end edge thereof, a third end wall panel foldably joined to said third riser panel along the inner edge thereof, a second side wall foldably joined to said third end wall panel along an edge thereof remote from said third riser panel, a fourth end wall panel foldably joined to said second side wall remote from said third end wall panel, a first medial partition panel foldably joined to said fourth end wall panel along an edge thereof remote from said second side wall and including at least one transverse partition panel struck therefrom, and a second medial partition panel having at least one transverse partition panel struck therefrom and being foldably joined to said first medial partition panel along the top edge thereof and disposed alongside but detached from



the adjacent one of said pair of riser panels, the longitudinal dimension of each of said medial partition panels plus the longitudinal dimension of the complementary portion of the corresponding riser panels being no greater than the longitudinal dimension of a side wall, and the free end portions of said medial partition panels respectively forming substantially identical transverse partition panels.

3,917,061
HEAVY DUTY ARTICLE CARRIER
James T. Stout, Acworth, Ga., assignor to The Mead Corporation, Dayton, Ohio
Filed Sept. 25, 1974, Ser. No. 509,001
Int. Cl.² B65D *75/00*
U.S. Cl. 206—187 **5 Claims**



1. A collapsible article carrier formed from a single unitary blank and comprising a bottom wall, upstanding side walls foldably joined to opposite side edges of said bottom wall, end walls foldably joined to the end edges of said side walls, a multi-ply longitudinal partition and handle structure foldably joined at its ends to said end walls along vertical fold lines disposed medially of said end walls and including a pair of outer handle panels foldably joined along one end edge to a pair of riser panels which are foldably joined to the adjacent end wall medially thereof at one end of the carrier and a pair of inner handle panels which are foldably joined at one end thereof to the end wall at the opposite end of the carrier along vertical medial fold lines, one of said inner handle panels having a longitudinal panel which extends downwardly toward and adjacent said bottom wall and longitudinally into overlapping relation with the riser panels at said one end of the carrier, cross partition strips foldably joined at their ends along vertical fold lines to said side walls and to said longitudinal partition and handle structure to define a plurality of article

receiving cells on each side of said longitudinal partition and handle structure, a transverse partition strut foldably joined to each of said cross partition strips along a downwardly inclined fold line at the outer end thereof, said transverse partition struts extending downwardly toward and adjacent said bottom wall and also extending inwardly to said longitudinal partition and handle structure, and a glue flap foldably joined to each side edge of each of said struts and secured in flat face contacting relation to said side walls and to said longitudinal panel respectively so as to provide transverse reinforcement for the carrier and to aid in separating adjacent articles from each other.

3,917,062

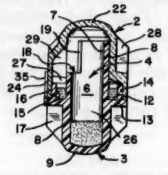
MIXING CONTAINER FOR DENTAL MATERIALS

Robert Winters, Ridgefield, Conn., assignor to Sterndent Corporation, Mount Vernon, N.Y.

Filed Nov. 1, 1974, Ser. No. 520,162

Int. Cl.[2] B65D *25/08;* **A61B** *19/02*

U.S. Cl. 206—219 **14 Claims**



14. A container for dental materials comprising:

a. an upper housing and a lower housing with both housing being made of semi-rigid plastic;

b. the lower housing being opaque, the upper housing being translucent, and both being of a unitary structure;

c. the lower housing having an elongated cylinder closd at the bottom and open at the top such that dental material can be loaded into the cylinder through the top;

d. an annular member circumscribing the elongated cylinder approximately midway between the top and the bottom of the cylinder, the annular member being defined by a bottom surface extending perpendicular to the cylinder, a circular wall extending parallel to to said elongated cylinder and upwardly from the outer edge of the bottom surface, and the outer wall of said elongated cylinder;

e. ribs extending in a radial direction outwardly from the cylinder connecting the bottom surface of the annular member to the outer wall and bottom of the cylinder;

f. said cylinder defining at the top thereof a keyway cut out of the inner and outer walls and a slot circumferentially larger than said keyway, also cut out of the top and in communication with the keyway;

g. the upper housing defining a cylindrical receptacle for receiving the cylinder of the lower housing, said receptacle being closed at one end and open at the other annular area concentric with said receptacle extending from the upper end thereof;

h. said annular area being defined by cylinder wall having an internal diameter slightly larger than the diameter of the outer wall of the cylinder of the lower housing such that the cylinder wall can fit snugly over the outer walls of the annulus and allow rotational movement, and a bottom surface extending from the end of the receptacle connecting the receptacle to the cylinder wall;

i. an opening is provided through said bottom surface to form a passageway the annular area and the receptacle;

j. the receptacle having an internal diameter slightly larger than the diameter of the outer wall of the cylinder such that the receptacle can fit snugly over the cylinder wall and rotational movement;

k. said cylinder being engageable with said receptacle to that form a mixing cavity defined by the bottom of the receptacle and the cylinder which confines material therein from the annular area, and said annular cavity for confining material therein from the mixing cavity and the outside;

l. said housing being rotatable relative each other for moving the housings to an open position where the keyway and the open position register and moving housing to a closed position where the cavities are sealed from one another;

m. a stop member extending from the internal surface of the receptacle to cooperate with the slot in the cylinder for stopping the slot at the open position and the closed position;

n. said upper housing having a mark in the area of the opening and said lower housing having markings to register with the mark on the upper housing to indicate the open and closed position; and

o. said upper and lower housings being engageable and disengageable by moving each housing opposite each other on a direction along the center line.

3,917,063

PACKAGES ENABLING THE EXTEMPORANEOUS PREPARATION OF SUSPENSIONS OR STERILE SOLUTIONS

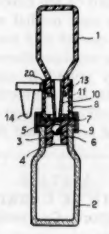
Jean Chilbret, and Charles Manni, both of Fontvieille, Monaco, assignors to Societe d'Emballage et de Conditionnement, Fontvieille, Monaco

Filed June 6, 1973, Ser. No. 367,437

Claims priority, application France, June 13, 1972, 72.21179

Int. Cl.[2] B65D *25/08*

U.S. Cl. 206—221 **12 Claims**

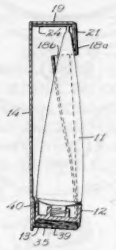


1. A package comprising two flasks of which at least one is of a flexible material and which are adapted to contain one a liquid and the other a solid product which is a selected member of the group consisting of substances dissolvable in and substances suspendible in said liquid at the time of use, stopper means on each flask and means for temporarily putting the interiors of the two flasks into communication with one another through at least one part of said stopper means, said at least one of the flasks being manually deformable to effect the passage of the liquid from its flask into that of the solid product and the return of the solution or of the suspension to the flask for the liquid, said flasks are kept together in alignment and in readiness for the putting of their contents into communication with each other by spacing means which can be torn away.

3,917,064
TUBE DISPLAY CARTON

Harry I. Roccaforte, Western Springs, Ill., assignor to Hoerner Waldorf Corporation, St. Paul, Minn.

Filed Dec. 30, 1974, Ser. No. 537,315
Int. Cl.[2] B65D *85/14, 5/52*
U.S. Cl. 206—277 4 Claims



1. In a carton adapted for holding and displaying squeeze tubes and the like, said carton made from foldable paperboard or similar sheet-like material and having a rear panel, side panels, top and bottom closure flaps, as well as upper and lower sections in said front panel defined by a horizontal line cut in said front panel;

said lower front panel section including a pair of inwardly movable shadow panels on either lateral side of said lower section;

said shadow panels defining in said lower section a tube-receiving opening extending to the lower edge of said front panel;

said carton adapted to hold a squeeze tube having a recessed cap at the bottom of said carton and the crimped end of said squeeze tube retained in position between said upper and lower sections in said front panel;

an improved cap support tab means for facilitating loading of said tube into said carton and retaining said tube and cap within said carton, comprising:

an inwardly foldable cap support tab made of said paperboard and hingedly attached to a first of said bottom closure flaps, said tab positioned between said shadow panels in the front of said carton and adapted to be folded inwardly upon placing said tube into said carton;

said tab having formed therein a front facing V-shaped cut; and

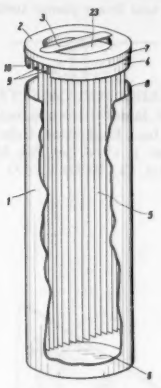
said tab also having formed in the edge opposite said first bottom closure flap a section of a circle adapted to engage said recess in said cap.

3,917,065
DEVICE FOR PACKING, TRANSPORTING AND STORING READY-MADE CURTAINS OR DRAPES

Hermann Pape, Laggenbeck, Germany, assignor to Gardisette Holding AG, Switzerland

Filed Dec. 26, 1973, Ser. No. 427,994
Claims priority, application Germany, Dec. 22, 1972, 2262848
Int. Cl.[2] B65D *85/00*
U.S. Cl. 206—326 34 Claims

1. An arrangement for packing, transporting and storing ready-made curtains or drapes provided with hanger means at the top edge thereof, the arrangement comprising: container means provided with an opening for receiving the curtains or drapes, cover means for selectively covering said opening, and means provided on said cover means for receiving the hangers to suspend the curtain or drapes in said container means including at least one rail means provided on the underside of said cover means, said cover means being provided with a rim portion projecting beyond the end of said at least one rail means, said rim portion being provided with an aperture

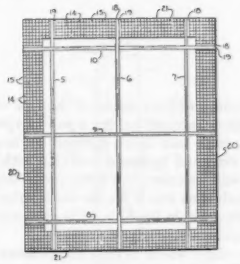


means for enabling the hangers to be disposed on said at least one rail means.

3,917,066
PALLETIZED LOAD WITH COMPRESSION FRAME

Harold S. Cloyd, Erie, Pa., assignor to Nosco Plastics, Incorporated, Erie, Pa.

Filed Mar. 22, 1973, Ser. No. 343,934
Int. Cl. B65d *85/00, 71/00*
U.S. Cl. 206—386 6 Claims



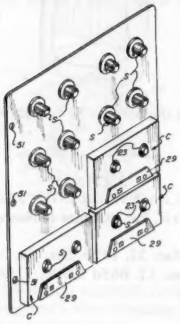
1. A pallet having a rectangular load carrying surface and fork lift openings below said surface, a load in the form of a rectangular parallelepiped on said surface, said load comprising a plurality of tiers of bottles and the like with the bottle tops uppermost, a hollow rectangular compression frame engaging the tops of the bottles in the upper periphery of the load, strapping for holding the load on the pallet, said strapping extending from the pallet up one side of the load over the top of the frame and down the opposite side of the load to the pallet and also extending from the pallet up one end of the load over the top of the frame and down the opposite end of the load to the pallet, said compression frame comprising two side pieces and two end pieces forming a hollow rectangle registering with an underlying load carrying surface of the pallet said pieces being united at the corners and having lower planar surfaces engaging the bottle tops of the top tier of the upper periphery of said load and upper planar surfaces for receiving an upper pallet stacked on top of said frame so the load received by said frame from said upper pallet is transmitted from the frame directly to the bottle tops of the top tier of the upper periphery of said load, said side and end pieces each comprising a lattice of intersecting ribs united to each other

at the intersections, said ribs extending edgewise between and being normal to said surfaces with the upper edges of said ribs comprising said upper planar surface and the lower edges of said ribs comprising said lower planar surface.

3,917,067
CARRIER FOR CASSETTES

Rollen E. Brown, and James Girdwood, both of Denver, Colo., assignors to Utex, Inc., Englewood, Colo.

Filed Apr. 1, 1974, Ser. No. 456,446
Int. Cl.² B65D *85/672*
U.S. Cl. 206—387 **11 Claims**



1. In combination with a cassette of the type which is shaped as a flat, box-like container having a pair of spaced-apart reel hub openings, each hub being formed by inwardly turned, opposing hub rims and having a reel ring within the cassette at each hub with circular, inwardly projecting flange lying between the hub rims and with the inner edge of the flange forming an orifice within the hub, a cassette carrier to hold the cassette comprising:

a. a flat base sheet where against the cassette is placed; and

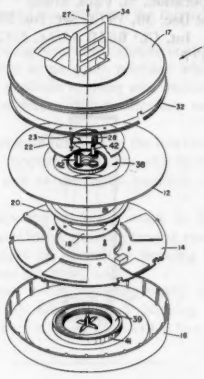
b. a generally cylindrical, resilient stud outstanding from the base sheet proportioned to extend into a reel hub opening and into and through the reel flange orifice therein to resiliently grip the reel flange therein whenever the cassette is placed against the base sheet, whereby to hold the cassette in place.

3,917,068
DISC CARTRIDGE INCLUDING DRAW PLATE

George T. Cheney, Manchester, N.H., assignor to Nashua Corporation, Nashua, N.H.

Continuation-in-part of Ser. No. 328,933, Feb. 2, 1973, abandoned. This application July 19, 1974, Ser. No. 489,916
Int. Cl.² B65D *85/38*
U.S. Cl. 206—444 **20 Claims**

1. A circular draw plate for a disc cartridge of the type which has post apertures through which posts are secured to the draw plate and a pair of posts for engagement with a handle assembly on a cover of the disc cartridge wherein the improvement comprises a circular draw plate having a pair of warp reducing apertures, each of said warp reducing apertures and the post apertures being located an equal distance from the center of the circular draw plate and each warp reducing aperture being along an inner circumference of said circular

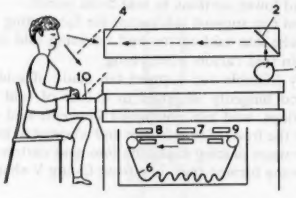


draw plate at a distance of 90° of arc from a post aperture also located along said inner circumference.

3,917,069
ARTICLE SORTING EQUIPMENT

Donald Kenneth Alexander, 1 White Hill Drive, Bexhill-on-Sea, Sussex, England

Continuation of Ser. No. 225,919, Feb. 14, 1972, abandoned. This application Oct. 23, 1973, Ser. No. 408,759
Claims priority, application United Kingdom, Feb. 16, 1971, 4716/71
Int. Cl.² B07C *7/00*
U.S. Cl. 209—74 M **6 Claims**



1. Equipment for sorting articles according to predetermined physical characteristics of the articles which articles are carried on an article conveyor at locations on the conveyor with the articles moving between an inspection station and a discharge station in a given period of time, said equipment including a device at said discharge station for discharging an article on said conveyor at said discharge station from said conveyor when said device is provided with an appropriate signal, a memory connected to said device to supply signals thereto and means at said inspection station and connected to said memory to initiate said supplied signal after being retained by said memory for said period of time, the improvement comprising:

said memory including means defining a read-in station, means defining a read-out station at a location spaced from the read-in station, an endless repetitive sequential signal carrier for carrying signals from said read-in to said read-out stations at a rate which is correlated to said given rate of speed of said conveyor, said means at said inspection station supplying said signal to said carrier at said read-in station, said signal carrier supplying said signals to said discharge device.

mirror means positioned at said inspection station for increasing the area of the article which is exhibited for viewing at a particular position adjacent the conveyor, and

mounting means attached to said mirror means for moving said mirror means along a given path during the operation of said equipment to vary the area of the article reflected in the mirror means for viewing.

3,917,070

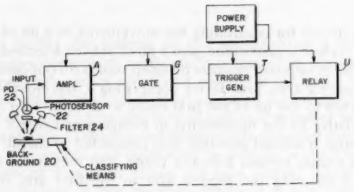
METHOD AND SYSTEM FOR GRADING ARTICLES ACCORDING TO COLOR

Emil S. Asfour, 21 Wengirain 8704, Herrliberg, Switzerland

Continuation of Ser. No. 235,342, March 16, 1972, abandoned. This application Aug. 15, 1974, Ser. No. 497,649

Int. Cl. B07c *5/342*

U.S. Cl. 209—111.6 **14 Claims**



1. A system for grading articles according to apparent color comprising means for supporting said articles, a photo-sensor having detector means for sensing the light remission value of each said article, means restricting the response of said photo-sensor to a defined wave length range approximately coextensive with the wave length range at which the remission curve of a specific article at ascending wave lengths inverts, said photo-sensor producing a signal variable in response to the level of said light remission in said range, means for converting said signal to a voltage proportional thereto, a gating circuit adapted to convert said voltage into a pulse at a given level of said voltage, trigger means responsive to said pulse, and classifying means responsive to said trigger means for removing said article from said support.

3,917,071

WEAPON SECURITY RACK

Russell W. Walters, Reading, Pa., assignor to BMR Security Products Corporation, Richmond, Ky.

Filed Jan. 23, 1974, Ser. No. 435,942

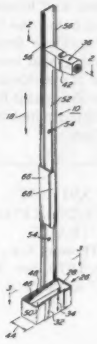
Int. Cl.² A47F *7/00*

U.S. Cl. 211—64 **16 Claims**

1. A weapon security rack for securing only a single weapon extending in a longitudinal direction having a front and a butt portion, said front portion being formed of a first section having a predetermined diameter and a second section having an increased diameter with respect to that of said first section, comprising:

a butt housing for receiving internally said butt end of said single weapon, said housing having a predetermined dimension in said longitudinal direction; and,

a mount longitudinally displaced from said butt housing and including a mount passage having a wall for supporting said first section, bar lock means movable within and lockingly secured to said mount for blocking said passage thereby capturing and locking said first section between said passage and said bar lock means, said mount having a surface located a predetermined distance from said



second section, said predetermined distance being less than said dimension of said butt housing.

3,917,072

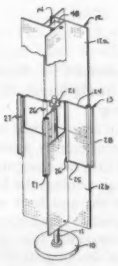
UPRIGHT REVOLVING DISPLAY RACK

Theodore M. Bleed, Rockford, Ill., assignor to Commercial Wire and Display Prod. Corp., Rockford, Ill.

Filed Jan. 15, 1975, Ser. No. 541,124

Int. Cl.² A47F *5/02*

U.S. Cl. 211—167 **12 Claims**



1. In an upright revolvable display rack including a base, a center post extending upwardly from the base, a foldable frame structure rotatably mounted on said post, and means on said post engaging said frame structure for rotatably supporting the frame structure at a selected level on the post, said frame structure including hub means, a plurality of frames each including upper and lower arms attached at one end to said hub means and first and second upright channels secured to opposite sides of the upper and lower arms of each frame at locations spaced outwardly from the hub means, the frames being mounted on the hub means for relative movement between an expanded position in which the frames are angularly spaced apart around the hub means and a collapsed position in which adjacent ones of the frames are in sidewise adjacent relation for reception in a relatively flat package, the upright channels on adjacent sides of adjacent frames defining oppositely facing pairs of channels when the frames are in their expanded position, and a plurality of vertically elongated display panels each having opposite side edges thereof slidably extending into a respective pair of oppositely facing channels on adjacent frames, the improvement comprising said frames

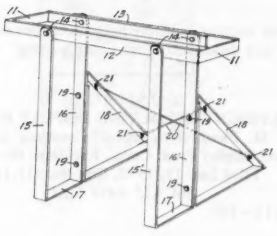
each having a vertical length which is substantially shorter than said vertically elongated display panels and said display panels each comprise separate upper and lower panel sections having their adjacent ends in abutting relation at a location intermediate the upper and lower ends of channels on the frame structure, said upper and lower panel section respectively extending above and below the frame structure, a lower panel connector means separate from said foldable frame structure for interconnecting said lower panel sections at a level below said foldable frame structure, and upper panel connector means separate from said foldable frame structure for interconnecting said upper panel sections at a level above said foldable frame structure.

3,917,073

FOLDABLE ADVERTISING LITERATURE DISPLAY RACK

Richard E. Kulkey, 534 Thomas Ave., St. Paul, Minn. 55103

Filed Sept. 13, 1973, Ser. No. 397,088
Int. Cl.² A47F 5/10, 7/00
U.S. Cl. 211—178 **4 Claims**



1. A unitary, nondisassemblable foldable display rack for display of sheets of advertising literature in substantially vertical orientation comprising:

a. a first elongated, thin strip of rigid material, the free ends of said first strip permanently joined together with said joined strip formed into an elongated rectangle defining a literature receiving opening, the long sides of said rectangle defining the front and back sides respectively and the short sides the ends of said rectangle;

b. second and third elongated thin strips of rigid material formed to define two sets of generally U-shaped leg members which extend transversely to the plane of said rectangle when said dispaly rack is in an operational position the free ends of each of set of arms of said U-shaped leg members pivotally and permanently joined to the outer surfaces of the front and back sides of said rectangle inwardly of said rectangle ends, the rear leg members being shorter than said front leg members, the base of said U-shaped members being flat and forming an obtuse angle with said rear legs the length of said U-shaped leg members and the opening defined by said U-shaped members being of sufficient size to permit rotation of each of said leg members through at least 90° with respect to said rectangle, and

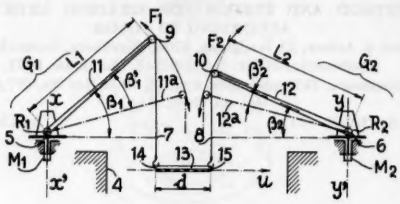
c. stabilizing means, said stabilizing means comprising two triangularly shaped thin strips of rigid material each respectively permanently joined to and extending rearwardly from one of said rear legs, the base of said triangularly shaped strips, aligned with respect to the base of said U-shaped leg members to be in the same plane therewith and one leg of each of said triangularly shaped strips coextensive with a major portion of the length of said rear leg members.

3,917,074

CONTROL DEVICE FOR HOISTING MACHINES

Jean Havard, Avenue de Thalie, 44470 Carquefou; Henri Charonnat, 95, Rue de la Galarniere, 44400 Reze, and Francois Cova, Lotissement de Bel Air, 44 Carquefou, all of France

Filed Dec. 19, 1973, Ser. No. 426,043
Claims priority, application France, Dec. 19, 1972, 72.46115; July 31, 1973, 73.28601
Int. Cl.² B66C 23/00
U.S. Cl. 212—47 **24 Claims**



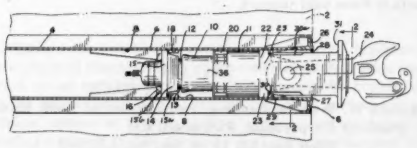
1. A device for controlling the movements of a jib of a first crane, termed a pilot crane, and a jib of at least a second crane mounted in opposed relation on fixed stands on opposite sides of a handling area, said device comprising a first movable arm connected to the jib of the first crane so as to give an indication relative to the movements in swinging and steeve of the first crane, a second movable arm connected to the jib of the second crane, termed follower crane, and means for operatively connecting the second arm to the first arm in such manner that the second arm effects movements corresponding to the position that the jib of the second crane must occupy in accordance with the position of the first crane given by the first arm whereby the load being hanlded by said cranes always remains parallel to a predetermined orientation irrespective of the orientation and steeve given to said pilot crane.

3,917,075

HYDRO-PNEUMATIC CUSHION GEAR FOR RAILWAY CAR

Willis Harding Knippel, Palos Park, Ill., assignor to Pullman Incorporated, Chicago, Ill.

Filed Dec. 16, 1974, Ser. No. 532,804
Int. Cl.² B61G 9/12, 11/12
U.S. Cl. 213—8 **31 Claims**



1. In a railway car including a car coupler and a hollow open end center sill structure having a cushion pocket therein and a hydraulic cushion unit in the pocket and attached to the car coupler and receiving buff and draft forces;

a rear buff stop means on the center sill structure, rear draft stop means on the center sill structure outwardly of the buff stop means,

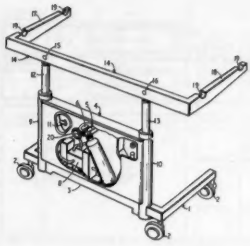
said cushion unit having a cushion base plate held between said rear buff stop means and said rear draft stop means, said cushion unit having piston means including a piston rod fixedly attached to the outer forward end of said base plate and a piston head, and

said cushion unit including a hydraulic cylinder reciprocally movable over said piston head and piston rod forwardly of the rear end of said piston rod.

3,917,076
TROLLEYS

Duncan Islay Campbell, 65 Lord St., Roseville, New South Wales, Australia (2069)

Filed Nov. 30, 1973, Ser. No. 420,519
Claims priority, application Australia, Dec. 1, 1972, 1451/72
Int. Cl.² A61G 1/06
U.S. Cl. 214—1 D **2 Claims**



1. A trolley, for picking up and setting down a stretcher, said trolley comprising substantially a horizontal side member, adjacent each end of which and transverse thereto is secured an extending horizontal support member, said support members being located on one side of said side member to define a substantially U-shaped and horizontally disposed base frame which is movable and supported on wheels, a stretcher support spaced from and above the base frame, the stretcher support having a side member which is spaced apart and aligned substantially above the base frame side member and two substantially horizontal and laterally spaced stretcher support arms which are secured one to each end of the stretcher support side member, the stretcher support arms overhanging the base frame and being adapted to support a stretcher when it is mounted on and across the support arms, two upright hydraulic rams, each having a cylinder and a piston, the cylinders at an end remote from the pistons being fixedly secured to and adjacent each end of the base frame side member, the piston of each hydraulic ram being pivotally connected adjacent one end thereof to the stretcher support side member, at least one pivot of which is adapted to allow movement of the stretcher support side member with respect to the piston in a direction along the stretcher support side member, at least one high pressure gas cylinder containing a compressed gas, a pneumatic/hydraulic convertor and manual control means, whereby power available from the compressed gas can be converted to hydraulic power to raise or lower the pistons either in synchronism or relative to one another to obtain tilting of the stretcher support frame.

3,917,077
AUTOMATIC LENS MOLD GASKET STRIPPER

Joseph Tusinski, Colonial Heights, and Daniel Bobeau, Hopewell, both of Va., assignors to Coburn Optical Industries, Inc., Muskogee, Okla.

Filed Feb. 15, 1974, Ser. No. 442,989
Int. Cl.² B28B 7/12
U.S. Cl. 214—1 R **7 Claims**

1. A stripping mechanism for removing an annular gasket from a mold assembly of a type having the annular gasket circumscribing the peripheries of a pair of spaced lens molds comprising,

a framework,

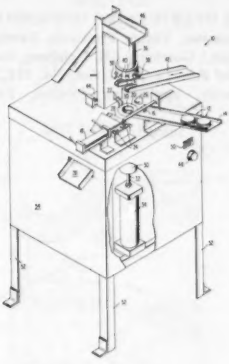
a ram means supported on said framework along an axis,

a piston extending outwardly from said ram along said axis,

a circular mold assembly supporting rim at the end of said piston having an outside diameter less than the diameters of said molds,

a generally hollow stripper head located directly opposite said ram along said axis,

a stripping rim at that end of said head closest to said ram having an effective inside diameter less than the outside diameter of said gasket but greater than that of said peripheries,



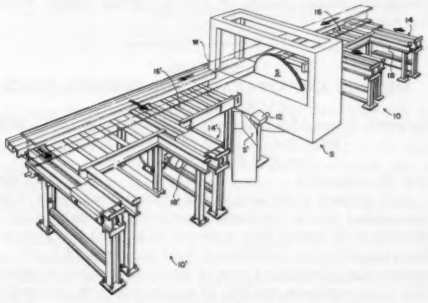
power means sequentially moving said ram and said stripper relative to one another along said axis from a first position wherein said head is spaced from said supporting rim a sufficient distance to enable a mold assembly to be placed thereon to a second position wherein said ram is received into the interior of said head,

whereby said stripper rim will peel said gasket from said lens mold as it is moved from said first position to said second position.

3,917,078
ELONGATE-MATERIAL TRANSPORT SYSTEM

Hans V. Schmidt, Mount Vista Road, Kingsville, Md. 21087

Filed May 28, 1974, Ser. No. 473,886
Int. Cl.² B65G 37/00
U.S. Cl. 214—1 P **18 Claims**



18. In a material transport system having a roller way for advancing elongate stock longitudinally therealong and a cross transport system having elevatable structure for loading elongate stock onto the roller way, the improvement comprising said cross transport system having: means for supporting elongate stock longitudinally parallel with the roller way length, means for lifting elongate stock from the supporting means and depositing on the roller way in longitudinal alignment with the roller way length said elongate stock lifted, including: horizontal guiding means, a respective outwardly convex structure extending from the horizontal guiding means

proximate each end thereof, fixed upright structure guiding all said outwardly convex structure, a wagon on the horizontal guiding means, means for moving the wagon along the horizontal guiding means, and means for raising and lowering the horizontal guiding means.

3,917,079

DEVICE FOR OVERTURNING OF PRISMATIC BODIES

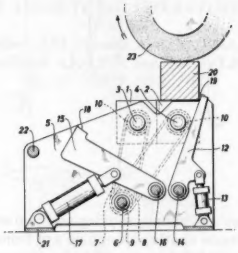
Bo Lennart Jonsson, Vastra Frolunda, Sweden, assignor to Centro-Maskin i Goteborg AB, Goteborg, Sweden

Filed Feb. 11, 1974, Ser. No. 441,226

Claims priority, application Sweden, Feb. 15, 1973, 7302115

Int. Cl.[2] B65G 7/00

U.S. Cl. 214—1 QG 5 Claims



1. A device for the overturning of polygonal bodies comprising at least one pair of overturning elements with each element having a square cross section in a plane perpendicular to the center axis of said element, a pair of shafts extending in a common horizontal plane with each of said elements being journalled on a different one of said shafts with each shaft extending through said center axis of its respective overturning element, said overturning elements being positioned side by side when two edges of said elements are in the same plane and parallel to a plane through their center axis whereby said elements are displaced relative to each other so that they partly overlap each other when rotating, means for rotating said elements about said shafts in the same direction whereby polygonal bodies placed on said polygonal bodies will be overturned.

3,917,080

METHOD AND APPARATUS FOR FORMING BRICK PACKS WITH VOIDS

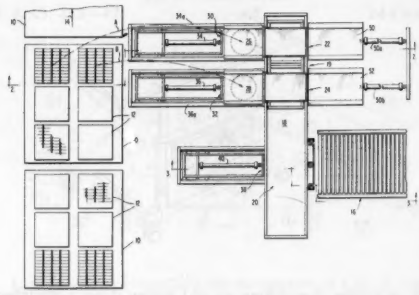
Robert E. Jones, 15 S. Oak Forest Drive, Asheville, N.C. 28803

Filed Jan. 8, 1974, Ser. No. 431,636

Int. Cl.[2] B65G 57/10, 57/26

U.S. Cl. 214—6 A 14 Claims

1. A method of stacking bricks to form brick packs of predetermined layers, the steps comprising in combination: simultaneously taking from a source of at least two groups of bricks each group including at least one layer of bricks and placing the groups on a pair of elevators situated in side-by-side relationship on one side of a conveyor path, successively taking additional groups of bricks from the source and directly stacking them on the elevators respectively, until a predetermined number of layers have been stacked on the elevators, transferring the stacked bricks from the elevators onto a pair of shuttle cars fixed to each other to be movable along the conveyor path, moving the shuttle cars together along the conveyor path until one shuttle car arrives at a discharge station for introducing the bricks into a further processing station such as a strapping station, transferring the bricks from the one shuttle car off the side of the conveyor path towards said steel strapping station, further moving the shuttle cars along said path until the other shuttle car is registered at said discharge station, removing the bricks from the other shuttle car off the side of the conveyor path towards said strapping station, returning the shuttle cars to their original positions adjacent said elevators, and repeating the above steps, and wherein there is further included the steps of taking certain brick layers from said two groups of bricks at said source and



depositing them on horizontal plates situated on the side of the conveyor path opposite the elevators, removing certain bricks therefrom to form voids in said certain layers, moving said plates over said elevator and then withdrawing said plates to deposit said certain layers with the voids therein on the elevator.

3,917,081

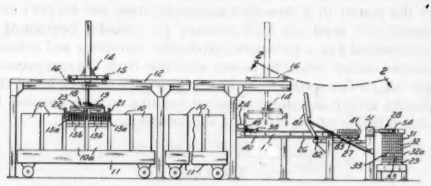
BRICK HANDLING SYSTEM

Frank S. Pearne, San Gabriel; Florentin J. Pearne, Blue Jay; William P. Osborn, Whittier; Terance M. King, Placentia, and Joseph A. Guzzetta, Newport Beach, all of Calif., assignors to Aircraft Mechanics, Inc., Downey, Calif.

Filed Jan. 9, 1974, Ser. No. 431,967

Int. Cl.[2] B65G 57/26

U.S. Cl. 214—6 A 13 Claims

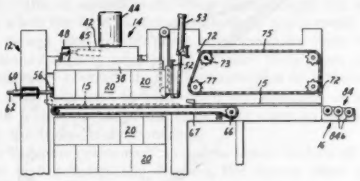


1. A system for forming layers of bricks each containing spaced rows of laterally abutting bricks comprising a first support supplied with a plurality of rows of abutting bricks extending to one edge thereof, a marshaling support substantially coplanar with said first support and movable in a direction aligned with said rows, first power means operable to move bricks in said rows past said edge onto said marshaling support and causing said marshaling support to move with the bricks thereon until a predetermined number of bricks from each row pass said edge, and a second power means operable to move said marshaling support in said direction to a predetermined position so that all bricks supported thereby are spaced from said edge and the rows of bricks remaining on said transfer support.

3,917,082
DESTACKING APPARATUS

Richard W. Howard, Forest Lake Township, Washington County, and Roman J. Weier, North St. Paul, both of Minn., assignors to Wyard Industries, Inc., Forest Lake, Minn.

Division of Ser. No. 299,948, Oct. 24, 1972, Pat. No. 3,831,733. This application Nov. 2, 1973, Ser. No. 412,111
Int. Cl.² B65G 59/04
U.S. Cl. 214—8.5 D **4 Claims**



1. A destacking device adapted for serially removing tiers of containers from a stack and placing said tiers in a separating apparatus, said destacking device comprising:

a hoist for raising and lowering a stack of containers arranged with a plurality of containers in side-by-side order in a rectangular tier,

a suction head positioned above said hoist in a fixed position, said suction head comprising a hood having a perforate plate and blower means for establishing subatmospheric pressure within said hood upon engagement of a tier of containers with said perforate plate of said hood,

bar means disposed in a plane below said plate and about said hood, said bar means comprising a gate mounted adjacent said hood for reciprocation in a plane generally parallel to the path of said hoist, and at least one bar extending parallel to said gate and movable toward and away from said gate,

means mounting said at least one bar for movement toward the path of said hoist for engaging a tier of containers positioned against said perforate plate of said suction head for crowding said containers together and holding the same against said gate,

plate means movable along a path normal to and into and out of the path of said hoist and under said gate between a load position beneath a tier of containers disposed against said suction head for receiving said tier of boxes and a discharge position spaced from the path of said hoist, and

drive means for raising said hoist, for energizing said suction head, for actuating said bar means to move the same toward a said tier, for lowering said hoist, for moving said plate means to said load position, for de-energizing said suction head and releasing said bars to place said containers on said plate means, and for moving said plate means transversely out of the path of said hoist to said discharge position.

3,917,083
LOAD LIFTING AND TRANSPORTING ARRANGEMENT

Patrick Carn, Route De Benodet, Quimper 29000 Finister, France

Filed Jan. 8, 1974, Ser. No. 431,763
Claims priority, application France, Jan. 8, 1973, 73.01205
Int. Cl.² B65G 67/02; B62D 63/08
U.S. Cl. 214—38 CA **5 Claims**

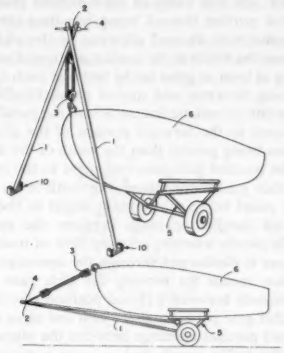
1. Load lifting and transporting arrangement comprising

A. gantry means for suspending the load to be lifted above a surface,

1. said gantry means being movable from a first position for lifting a load to a second position for transporting the load,

2. said gantry means having extremities for resting on the surface above which said load is lifted when in the first position;

B. a wheeled trailer including an undercarriage for placement beneath said load; and

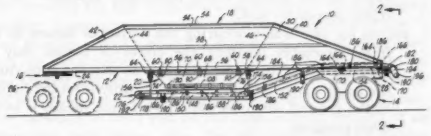


C. coupling means for attaching said extremities to the undercarriage of said trailer to form a drawbar for anchoring said load and pulling said trailer when the gantry means is moved to the said second position.

3,917,084
COMBINATION BOTTOM DUMP AND REAR DISCHARGE TRAILER

George W. Swisher, Jr., Oklahoma City; Michael F. Hopkins, Bethany, and Robert K. Gepfert, Del City, all of Okla., assignors to CMI Corporation, Oklahoma City, Okla.

Filed Apr. 18, 1973, Ser. No. 352,339
Int. Cl.² B60P 1/00
U.S. Cl. 214—83.26 **4 Claims**



1. In an apparatus for transporting particulate materials or the like which includes a frame assembly having a forward portion and a rear portion, wheel means mounted on the rear portion for supporting the apparatus on the ground, and a hopper carried by the frame assembly intermediate the forward and rear portions thereof and having an opening formed in the bottom portion thereof, the improvement comprising:

a housing disposed between the hopper having upper and lower openings formed respectively in the upper and lower portions thereof, the upper opening thereof communicating with the opening in the bottom portion of the hopper;

a plurality of spaced parallel baffle panels extending substantially horizontally across the lower portion of the housing and forming thereby a plurality of substantially equally spaced parallel openings of substantially equal width therebetween;

slide gate frame means having a forward portion and a rearward portion and slidably disposed beneath and adjacent to the lower portion of the housing for substantially horizontal movement relative to the housing;

a plurality of spaced parallel gate panels extending substantially horizontally across the slide gate frame means in substantial parallel alignment with the plurality of baffle

panels and forming a plurality of spaced parallel openings therebetween through the slide gate frame means, the forward edges of adjacent spaced parallel gate panels being substantially equally spaced, said spacing being substantially equal to the spacing between adjacent spaced parallel openings between said parallel baffle panels, and the width of each parallel gate panel at the medial portion thereof being less than the width at the opposite ends thereof adjacent to the slide gate frame means, the width at the medial portion of each gate panel being at least as great as the width of each spaced parallel opening between said spaced parallel baffle panels, and the width of said medial portion of the parallel gate panels adjacent to the forward portion of the slide gate frame means being greater than the width of the medial portion of the parallel gate panel adjacent to the rear portion of the slide gate frame means, the width of the latter parallel gate panel being substantially equal to the width of the spaced parallel openings between the spaced parallel baffle panels whereby an even flow of material from the hopper is discharged through the openings;

actuation means for moving the slide gate frame means alternately between a closed position wherein the spaced parallel gate panels register with and close the respective spaced parallel openings between the plurality of spaced parallel baffle panels and an open position wherein the spaced parallel gate panels register with the respective plurality of spaced parallel baffle panels and open the plurality of spaced parallel openings therebetween;

control means operatively connected to the actuation means for controlling the operation of the actuation means in response to an external stimulus;

conveyor means, having one end portion thereof disposed beneath the plurality of spaced parallel openings in the housing and having the opposite end portion disposed a distance from the spaced parallel openings for conveying the contents of the hopper thereon from the first end portion to the opposite end portion when the slide gate frame means is in the open position, the opposite end portion of the conveyor means being disposed to the rear of the wheel means whereby the contents of the hopper are conveyed to the rear of the frame assembly, the conveyor means further being removably securable to the frame assembly; and,

means for removably securing the conveyor means to the frame assembly whereby the conveyor means may be detached from the frame assembly so that the contents of the hopper may be dumped downwardly from the hopper to the ground when the slide gate frame means is in the open position.

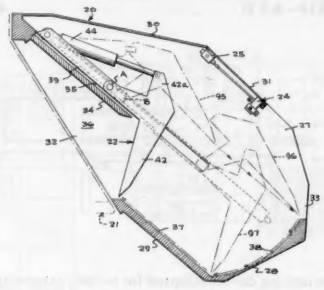
3,917,085

REFUSE PACKER CONTROL SYSTEM

Roland W. McKenzie, Culpepper, Va., assignor to City Tank Corporation, Culpepper, Va.

Filed May 6, 1974, Ser. No. 467,514
Int. Cl.[2] B65F 3/00
U.S. Cl. 214—88.3 **15 Claims**

1. In a refuse collection vehicle including a refuse storage body, a refuse receiving hopper mounted on said refuse storage body and communicating interiorly with said storage body, a mechanism mounted in said refuse receiving hopper for transferring refuse deposited in said hopper into said storage body and compacting the refuse therein, said mechanism including a panel engagable with refuse deposited in said refuse receiving hopper, a first fluid actuated component operatively connected to said panel, a second fluid actuated component operatively connected to said panel and cooperable with said first fluid actuated component for cycling said panel through a predetermined cycle, and a fluid system for operating said first and second fluid actuated components, said fluid system including a first means communicating with a source of fluid under pressure for controlling the supply of fluid under pressure for actuating said first actuated component and second means communicating with the source of fluid under pressure for controlling the supply of fluid under pressure for actuating said second fluid actuated component, an assembly for interrupting and stopping the cycling of said panel comprising means operable in a first condition for diverting fluid from said source of fluid under pressure, from



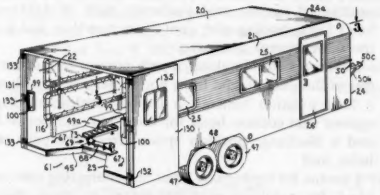
said fluid supply control means, means for biasing said diverting means into said first condition, and manually actuated means operatively connected to said diverting means for removing said diverting means from said first condition, against the action of said biasing means, thus preventing the diversion of said fluid under pressure from said fluid supply control means.

3,917,086

COMBINED BOAT CARRYING AND CAMPING TRAILER

Robert L. Sexton, 3508 Bridge Manor Drive, Kansas City, Mo. 64137

Filed Jan. 30, 1974, Ser. No. 437,840
Int. Cl.[2] B60P 3/10, 3/32
U.S. Cl. 214—84 **4 Claims**



1. A combined camping and boat carrying trailer for full floor submersion boat launching and retrieval comprising, in combination:

an elongate, enclosed trailer body of substantially rectangular, vertical side and end section, as well as horizontal section,

said body formed of substantially rectangular top, side and front end walls and an integral, flat floor joined at the ends thereof to one another,

the size of the trailer in plan view only slightly greater in length and width than the length and width of the boat to be carried,

the floor to ceiling height inside the trailer in excess of 6 feet,

a towing connection at the front end of said vehicle,

at least one pair of wheels carrying said body spaced intermediate the front and rear ends thereof,

the rear end closed by a pair of doors hinged substantially at the rear ends of the side walls, whereby to provide unrestricted boat handling access to the interior of said body across the entire vertical section thereof,

a plurality of boat receiving roller assemblies removably secured to said floor centrally thereof and spaced therealong,

at least one pair of laterally positioned, boat receiving roller assemblies also removably secured to said floor,

all of said roller assemblies sufficiently elevated above said floor so as to receive thereon, discharge therefrom and carry the boat upwardly of and free of the floor,

a small, central rear portion of said floor removable to make way solely for the outdrive assembly for the boat and replaceable to complete the floor as an integral flat surface when the boat outdrive assembly is not present,

winch means secured interiorly of said trailer body and positioned closely adjacent the trailer body front wall substantially centrally thereof and an access door through said front wall next to said winch for operation of said winch from exterior of the trailer and entry to and exit from the trailer body front end,

storage cabinets positioned across the inside surface of the front wall substantially framing the access door and winch,

living and camping equipment hingedly mounted on the interior of each side wall and pivotable within said trailer body from an "up" storage position on said walls and a "down" use position, and

a side access door substantially 6 feet in height positioned in one side wall of said trailer forward of said living and camping equipment and immediately rearward of said storage cabinets,

at least the entire floor and the lower portions of said side walls being of waterproof material, whereby the entire floor of said trailer and the lower portions of said side walls may be submerged in water in the processes of launching and receiving the boat on a body of water.

3,917,087

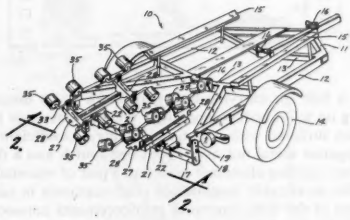
BOAT SUPPORTING APPARATUS

Byron L. Godbersen, 710 Circle Drive, Ida Grove, Iowa 51445

Filed July 19, 1974, Ser. No. 490,182

Int. Cl.[2] B60P *3/10*

U.S. Cl. 214—84 **10 Claims**



1. In a wheeled trailer adapted to be connected to a prime mover, the improvement comprising:

a frame including a pair of longitudinal members, a transverse member pivotally connected to said longitudinal members;

a first bracket member;

first means for pivotally mounting said first bracket member along a first longitudinal axis intermediate the ends thereof to said transverse member;

a second bracket member;

second means transversely spaced from said first bracket member for pivotally mounting said second bracket member along a second longitudinal axis intermediate the ends thereof to said transverse member;

a separate generally U-shaped member pivotally mounted centrally thereof along a transverse axis to each end of said first and second bracket members; and

a separate roller rotatably mounted on each end of said generally U-shaped members.

3,917,088

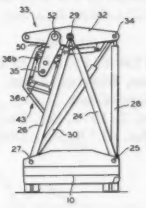
LOAD HANDLING APPARATUS

Peter J. Visser, Niles, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Division of Ser. No. 267,747, June 30, 1972, Pat. No. 3,827,743. This application Nov. 23, 1973, Ser. No. 418,350

Int. Cl.[2] B65G *67/02*

U.S. Cl. 214—130 R **4 Claims**



1. A load handling machine adaptable for mounting on a vehicle comprising an elongated base, a plurality of extendible and retractable supports projecting upwardly adjacent each end of the base and pivotally connected thereto, a pair of main boom arms pivotally connected in parallel relation at the tops of the said extendible support members adjacent the ends of the base respectively and horizontally disposed in a collapsed position, a pair of auxiliary boom arms pivotally connected at one end of each auxiliary boom arm to one of the said main boom arms respectively and extending downwardly in the collapsed position, a pair of actuators connected respectively between each said main boom arm and its said auxiliary boom arm for pivoting the latter to an aligned position adjacent the former in which the auxiliary boom arm in effect forms an extension of the main boom arm, a pair of latches for releasably securing the said main boom arms and the corresponding auxiliary boom arms together in the said aligned position, a load handling device pivotally connected to and suspended between the other ends of the said auxiliary boom arms in the said aligned position and adapted for transferring a load laterally over said base, at least on of said extendible and retractable supports at each end of the base located inboard of its respective main boom arm, the said load handling device abutting one of the said inboard extendible and retractable supports adjacent each end of the base to provide support in the collapsed position.

3,917,089

LOADING MACHINE

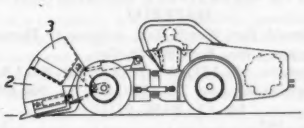
Sven Erik Nore Eriksson, Orebro, Sweden, assignor to Atlas Copco Akeiebolag, Nekka, Sweden

Filed Dec. 7, 1972, Ser. No. 313,129

Claims priority, application Sweden, Dec. 16, 1971, 16105/71

Int. Cl.[2] E02F *3/40*

U.S. Cl. 214—145 **8 Claims**



1. A loading machine comprising:

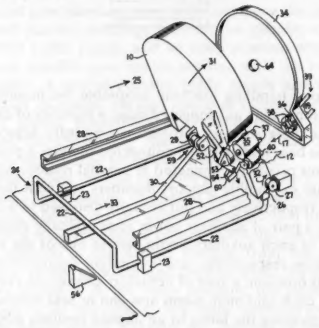
a. a vehicle for transporting the loaded material to a place of discharge;
b. a load bucket tiltably connected to arm means pivotally connected to said vehicle for raising and lowering the same to selective positions;
c. a scoop pivotally connected to said load bucket to be steered and raised thereby and dimensioned to be nested within said load bucket in the loading position and mounted to be tilted into a discharge position together with said load bucket as the loaded material is being discharged therefrom;
d. means connected to said vehicle effective to retain said scoop in a selective position while permitting said load bucket to be lowered into a material loading position.

3,917,090

POSTAGE METER TAPE RECEPTICLE SYSTEM

James G. Montagnino, Monroe, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Nov. 2, 1973, Ser. No. 412,326
Int. Cl.² B65G *65/00*
U.S. Cl. 214—146.5 **3 Claims**



1. A postage meter tape receptacle system for loading postage meter tape into a postage tape dispensing machine, comprising:
a container for receiving and dispensing a quantity of postage meter tape;
support means including a linear guide track means for supporting and guiding said container for movement within said dispensing machine, said support means supporting said container in a horizontal position with respect to the dispensing machine when tape is being received by the container, and supporting said container in a vertical position with respect to the dispensing machine when tape is being dispensed from said dispensing machine; and
means for slidably and pivotably moving said container from a tape receiving position to a tape dispensing position, said means for moving the container including a central camming track at least a portion of which is inclined with respect to said dispensing machine to provide movement of the container from the horizontal to the vertical position.

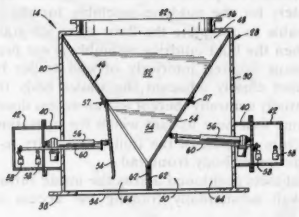
3,917,091

METHOD OF SELECTIVELY DISTRIBUTING BULK MATERIAL

Robert R. Herold, Fort Worth, Tex., assignor to Thomas Conveyor Company, Inc., Fort Worth, Tex.

Division of Ser. No. 358,131, May 7, 1973, Pat. No. 3,842,992. This application Aug. 26, 1974, Ser. No. 500,695
Int. Cl.² B65G *65/32*
U.S. Cl. 214—152 **2 Claims**

1. A method of selectively distributing bulk material to one or more separate locations comprising the steps of:
conveying bulk material into a distributor which includes a bulk material receiving section having a plurality of doors disclosed therein, each of said doors being sealingly communicated with a separate passageway sealingly connected to said separate locations so that when said doors are open bulk material flows by gravity from said receiving section of said distributor to said locations;



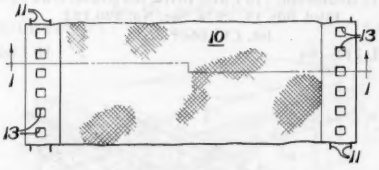
opening one or more selected doors in said distributor so that said bulk material flows by gravity to locations where it is desired to distribute the material while maintaining the remaining doors in a closed position; and
continuously indicating which of said doors are open and which are closed.

3,917,092

CONVEYOR BELT WITH SPROCKET DRIVE

Hebert E. McGinnis, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Aug. 16, 1971, Ser. No. 172,108
Int. Cl.² B60P *1/00*; B65G *15/30*
U.S. Cl. 214—83.36 **12 Claims**



1. A belt for carrying heavy loads for short distances by sliding on a flat bed, comprising a body of elastomer having a bottom surfaced with a material having a coefficient of friction against metal not over about one-fourth and a thick top of wear-resisting elastomer material, a pair of essentially inextensible steel cable longitudinal reinforcements in each edge portion of the belt, transverse reinforcements connecting the longitudinal reinforcements, and a row of sprocket holes between the cables in each pair.

3,917,093

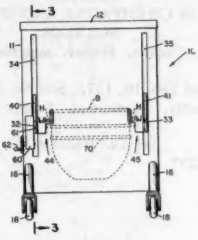
MIXING BOWL LIFT TRUCK

Roland E. Greaves, 1036 Harvard St., Rochester, N.Y. 14610

Filed May 6, 1974, Ser. No. 466,969
Int. Cl.² B65G *65/04*
U.S. Cl. 214—313 **6 Claims**

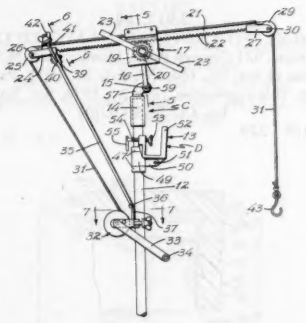
6. A lift truck for transporting a mixing bowl of the type having a pair of handgrips projecting from opposite sides thereof, comprising
a mobile housing supported on wheels for movement into and out of operative relation to a mixing bowl,
a pair of stationary, vertical tracks mounted in said housing, a pair of spaced, parallel arms mounted at their inner ends on said tracks for vertical movement thereon, and projecting in cantilever fashion horizontally out of a pair

of vertical slots in said housing to flank a mixing bowl disposed in operative relation to the housing,
drive means in said housing connected to said arms and operable selectively to raise and lower said arms in unison,
a pair of bowl supports removably and adjustably mounted on the outer ends of said arms and disposed to engage said bowl at diametrally opposite sides thereof to lift the bowl, when said arms are elevated, and automatically to



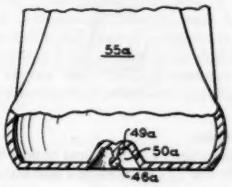
lower and disengage said bowl, when said arms are lowered,
means for adjusting the lateral spacing of said supports relative to their respective arms to enable use of the truck with bowls of different size, and
means mounting said supports on said arms for pivotal movement about a common axis to enable tilting and pouring of a bowl mounted on said supports,
each of said supports having in its upper surface a slot for accomodating one of said handgrips.

3,917,094
BOAT LOADER
Archie K. Magneson, 5408 Hughitt Ave., Superior, Wis. 54880
Filed Sept. 30, 1974, Ser. No. 510,603
Int. Cl.[2] B60R *9/00*
U.S. Cl. 214—450 **11 Claims**



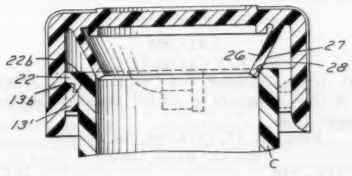
1. A boat lifter including:
a post,
means supporting said post in a substantially vertical position,
a gear box pivotally connected to the top of said post,
an elongated gear rack extending through said gear box and longitudinally movable with respect thereto,
pulleys at opposite ends of said gear rack,
a winch supported by said post spaced below said gear box,
a cable means secured to said winch and extending upwardly over one pulley at one end of said rack, extending longitudinally of said rack, and over said other pulley to extend downwardly for attachment to a boat or the like,
a link pivotally connected at one end to said post and pivotally connected to said rack near said one pulley,
a gear in said gear box engaging said teeth or said rack for moving the same, and
means for operating said gear in said gear box.

3,917,095
ORIENTED ARTICLE HAVING BEAD ATTACHED BY TAPERED STEM
Charles L. Seefluth, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Division of Ser. No. 250,293, May 4, 1972, Pat. No. 3,817,676.
This application Feb. 19, 1974, Ser. No. 443,473
Int. Cl.[2] B65D *1/02*
U.S. Cl. 215—1 C **6 Claims**



1. A bottle made of a thermoplastic material having a longitudinal bead connected to a bottom wall of said bottle by means of a longitudinal stem which flares outward in a direction toward said bottom wall, a distance between said bead and said bottom wall being greater in the center than near the ends of said longitudinal bead.

3,917,096
SAFETY PACKAGE
Peter Hedgewick, Windsor, Canada, assignor to Reflex Corporation of Canada Limited, Windsor, Canada
Filed Mar. 22, 1968, Ser. No. 715,391
Int. Cl. B65d *55/02*
U.S. Cl. 215—211 **28 Claims**



1. A one-piece, molded plastic safety cap of the type adapted to be applied to and removed from a container by axial motion followed successively by rotative motion relative to the container, said cap comprising: a base; a peripheral flange extending axially from said base for receiving the mouth of a container; a resilient flexible member surrounded by said flange having an inner annular end molded integrally to said base and extending axially therefrom and terminating in an outer annular free end, said free end being engageable with a container when the cap is mounted thereon; and a plurality of radially inwardly projecting locking lugs on the inner surface of said flange for engaging locking means on the mouth of a container received in the flange, said locking lugs having upwardly and radially outwardly extending surfaces.

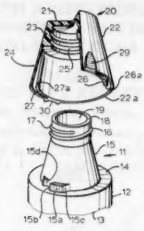
3,917,097
SAFETY CLOSURE CONTAINER

Gerhardt E. Uhlig, 1900 Alexis Road, Apt. L-201, Toledo, Ohio 43613

Continuation-in-part of Ser. No. 475,593, June 3, 1974, and a continuation-in-part of Ser. No. 288,129, Sept. 11, 1972, Pat. No. 3,830,391, which is a continuation of Ser. No. 16,427, March 4, 1970, abandoned. This application July 24, 1974, Ser. No. 491,534

Int. Cl.² B65D *55/02, 85/56;* A61J *1/00*

U.S. Cl. 215—216 25 Claims



1. In combination,

a container including (1) a principal hollow body serving as a receptacle and (2) a connected upstanding neck terminating in a rim-defined opening and having threads formed on the exterior annular surface of said neck for threaded engagement by cooperating thread means formed on a suitable closure,

a closure member including (1) a top wall spanning said rim-defined opening, said top wall being adapted to sealingly contact said rim, (2) a connected depending skirt having threads formed on the inner surface of said skirt adapted to threadingly engage said threads on said neck of said container,

said skirt and container each including, in coincident registration with said threads, cooperatively engageable and disengageable lock abutments, and

means associated with said closure adapted for purposeful dextrous manipulation to effect disengagement of said abutments, said combination being constructed such that said lock abutments are arranged as to allow rotational tightening beyond the stage of locking engagement of said abutments without any contact of said component parts of said closure or container as would induce distortion or stress in either said closure or container.

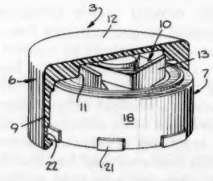
3,917,098
SAFETY CLOSURE CAP

Daniel D. Acton, Lancaster, and Carl E. Koontz, Thornville, both of Ohio, assignors to Anchor Hocking Corporation, Lancaster, Ohio

Filed Oct. 17, 1974, Ser. No. 515,647

Int. Cl.² B65D *55/02*

U.S. Cl. 215—219 25 Claims



1. A safety closure cap for sealing a container comprising the combination of an outer shell having a top and a depending skirt, an inner shell having a top and a depending skirt, means for rotatively coupling said shells together in nesting relationship, screw-type container engaging means on said inner shell for engaging cap engaging means on the container, ratchet means on said shells for coupling said shells when turned in a cap applying direction and permitting relative rotation between said shells in a cap unscrewing direction, and pressure operated means at the shell skirts for causing said shells to turn together when unscrewed from the container.

3,917,099
CAPSULE FOR CHAMPAGNE AND SPARKLING WINE BOTTLES

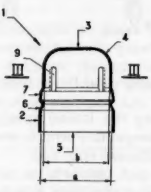
Rene Lorieux, Cachan, France, assignor to Cebal, Paris, France

Filed Feb. 10, 1975, Ser. No. 548,224

Claims priority, application France, Apr. 11, 1974, 74.12831

Int. Cl.² B65D *41/62*

U.S. Cl. 215—277 4 Claims



1. A capsule for covering and retaining a cork stopper which has been driven partially into a wine bottle having screw threads about its neck comprising a cylindrical member having a closed and an open end formed of thin formable sheet metal and of such internal diameter as to fit over said cork stopper and bottle neck, a plurality of grooves on the inner surface of said member substantially parallel to the vertical axis of said member and adapted to receive areas of said cork stopper which expand under internal pressure.

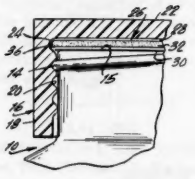
3,917,100
CLOSURE WITH ROTATABLE LAYERED LINER

Joseph Dukess, 931 Greacen Point, Mamaroneck, N.Y. 10543

Division of Ser. No. 164,658, July 21, 1971, Pat. No. 3,819,460. This application June 24, 1974, Ser. No. 482,417

Int. Cl.² B65D *53/04*

U.S. Cl. 215—329 5 Claims



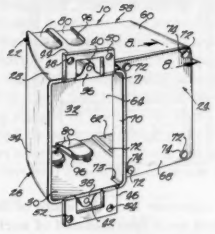
1. A closure device comprising a cap having a top and an internally threaded cylindrical side wall, said side wall having a groove therein adjacent said top, a liner normally rotatably disposed in said groove and including a disc having one outer layer and an intermediate layer and bonded thereto, said outer layer being relatively thin and non-resilient, said intermediate layer being resilient and being compressible to form a lip extending beyond the periphery of said outer layer and into engagement with said side wall in said groove, said intermediate layer being relatively thick.

3,917,101

OUTLET BOX AND METHOD OF MAKING THE SAME

Gordon K. Ware, St. Charles, Ill., assignor to Ware Fuse Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 137,146, April 22, 1971, abandoned. This application May 19, 1972, Ser. No. 255,168
Int. Cl.[2] H02G 3/12
U.S. Cl. 220—3.2 5 Claims



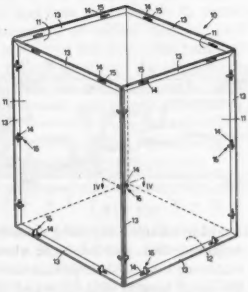
1. A box structure for assembly through an opening in a wall panel or the like and having means for supporting an electrical component, means providing a first box portion having opposite side walls, an end wall and a bottom wall, said box portion walls having upper margins at a box-opening opposite from said bottom wall, and means providing a second box portion joined with and extending laterally from said first box portion in a direction opposite from said end wall, said second box portion being in open communication with said first box portion and including a panel offset inwardly from said upper margins and covering an opening into the second box portion, said first box portion including a second end wall portion opposite from said first-mentioned end wall and extending outwardly from said panel for forming part of said upper margins, and deformable studs integral with said second box portion and projecting through said panel, said studs having ends thereof upset to retain the panel permanently over said second box portion.

3,917,102

COLLAPSIBLE CONTAINER

Renato Repetti, Forte dei Marmi, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Filed Oct. 31, 1973, Ser. No. 411,528
Claims priority, application Italy, Nov. 10, 1972, 70534/72
Int. Cl.[2] B65D 7/00
U.S. Cl. 220—4 F 7 Claims



1. A collapsible container comprising:

a plurality of panels each having a central planar portion and peripheral planar portions disposed at an acute angle with respect to the plane of the central planer portion, each peripheral portion of each panel positionable in a juxtaposed relationship with one peripheral portion of another panel when the panels are in an assembled state; and

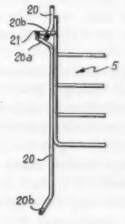
locking means for releasably locking the juxtaposed peripheral portions of the panels together to maintain the panels in an assembled state, said locking means comprising means defining at least one elongated aperture in each peripheral portion of the panels each aperture elongated along an axis parallel to the vertex of the angle between the central planar portion and the peripheral portion and positioned to be aligned with the corresponding aperture of a juxtaposed peripheral portion of another panel and locking members each removably insertable through two aligned apertures and each comprising a pin member and two wing members each having a clamping surface, the two wing members connected at either end of said pin member to space the clamping surfaces apart a distance substantially equal to the thickness of two juxtaposed peripheral portions and wherein each locking member when inserted in two aligned apertures is rotatable about the pin member from an unlocking position to a locking position wherein the clamping surfaces inwardly bear against the juxtaposed peripheral portions locking them together.

3,917,103

CONTAINERS MADE IN METALLIC WIRES

Oscar Beretta, 3 rue des Sablons, 92200 Neuilly, Seine, France

Filed Oct. 11, 1973, Ser. No. 405,654
Int. Cl.[2] B65D 7/24
U.S. Cl. 220—6 8 Claims

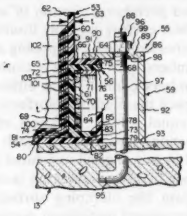


1. A collapsible metal wire container comprising a hollow base including a bottom and fixed edge wall secured to said bottom and extending perpendicular thereto, side walls mounted on said edge walls of the base, at least two of said side walls being opposed to one another and articulated to said edge walls, upper supports on the upper external part of said at least two opposed articulated side walls, lower supports on the exterior of the fixed edge walls, and feet mounted on the base and shaped relative to said upper and lower supports for selectively resting on the supports on an identical container, such that, when containers are stacked and the side walls are folded onto the base, the feet rest on the lower supports of the identical container and, when the side walls are erect, the feet rest on the upper supports of the identical container, said supports each being constituted by a metal wire bent in the form of a "U" and secured to the associated wall, the two arms of the "U" furthermore being bent in the horizontal plane, and an additional wire secured to the associated wall and being bent in the vertical plane adjacent the first mentioned metal wire so as to prevent horizontal sliding of the foot of an identical container resting on the support.

3,917,104
TANK CONSTRUCTION

Vincent J. Rossitto, Buffalo; Robert E. Baker, North Evans; James J. Jarvis, and James N. De Serio, both of Kenmore, all of N.Y., assignors to Metal-Cladding, Inc., North Tonawanda, N.Y.

Filed Mar. 6, 1974, Ser. No. 448,669
Int. Cl.² B65D *25/24*
U.S. Cl. 220—18 **4 Claims**



1. An upstanding fiberglass reinforced plastic tank adapted to receive and store a fluid exposed to atmospheric pressure, said tank having a bottom resting on a support and having a cylindrical side wall structure, the head of a fluid within said tank exerting hydrostatic pressure on said side wall structure which urges said side wall structure to expand in a radial direction, wherein the improvement comprises:

resisting means arranged at the lower portion of said tank and adapted to resist torsional stress in said tank lower portion produced by an external overturning moment applied to said tank, said moment causing a stress reversal in said tank lower portion by producing tensile forces in one part of said side wall structure and compressive forces in another part thereof, said resisting means including

annular lower flange means extending radially outwardly from said tank and having a lower face arranged in downwardly thrusting relation to said support;

annular upper flange means extending radially outwardly from said tank and arranged in vertically spaced relation to said lower flange means; and

anchorage means secured to said support and arranged to slidably engage said upper flange means and adapted to exert substantial downward force thereon when said moment is applied to said tank,

whereby such sliding engagement between said anchorage means and upper flange means may permit radial expansion of said side wall structure and, when said moment is applied to said tank, the tensile forces in said one tank part may be resisted by downward force exerted on said upper flange means by said anchorage means, and the compressive forces in such other tank part may be resisted by an upward force exerted by said support on said lower flange means.

3,917,105
INSERT ASSEMBLY FOR RECORD KEEPING

Gray Lambert, and Paul N. Hanselman, both of Wheaton, Ill.

Filed Nov. 9, 1973, Ser. No. 414,426
Int. Cl.² B65D *57/00*
U.S. Cl. 220—22 **12 Claims**

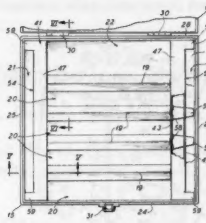
1. In an insert assembly for reception within a record keeping tray having a bottom wall and upstanding connected front, rear and opposite side walls:

an insert member formed from a folded blank having a base panel to be received on the bottom wall of the tray;

upstanding side panels folded up from said base panel and defining a storage space therebetween;

outward projections on said side panels for maintaining the side panels in spaced relation to the opposite side walls of the tray;

a plurality of generally upstanding dividers within said storage space and having anchoring lug flanges which are



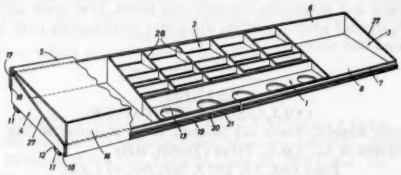
substantially narrower than the width of the dividers and projecting from each opposite end of each divider;

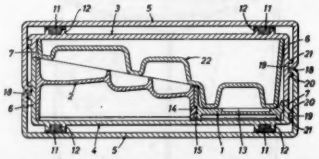
and each of said side panels having anchoring holes complementary to said anchoring lug flanges and into which said anchoring lug flanges extend with the ends of the dividers engaging the upstanding panels.

3,917,106
WATCH-REPAIRING SET-UP

Rene Maurice Bargetzi, La Chaux-de-Fonds, Switzerland, assignor to Reno S.A., La Chaux-de-Fonds, Switzerland

Filed Oct. 20, 1972, Ser. No. 299,267
Claims priority, application Switzerland, Oct. 20, 1971, 15280/71
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² B65D *21/02, 1/36*
U.S. Cl. 220—23.83 **7 Claims**





1. A watch repairing set-up comprising a movement-holder-strip, a repair materials box and two slide elements housing said strip and materials box, said strip, said box and said elements having the same length, said strip and said box being provided with longitudinal sides, at least one tenon projecting from one of said longitudinal sides and at least one corresponding recess in the other longitudinal side for receiving said tenon and for assembling said strip and said box side by side, each of said slide elements having two longitudinal walls spaced apart a distance equal to the width of the assembled

strip and box, and said slide elements being provided with corresponding hook up means for removably assembling said elements end to end.

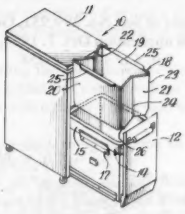
4. A watch repairing set-up comprising seven parts including a movement-holder strip, a repair materials box, two slide elements, two covers and a tool box, all of said parts having the same length, and each of them having two parallel longitudinal sides, said strip and said repair materials box being provided with assembling means for assembling the same side by side, said assembled repair materials box and strip being slidable in said slide elements, said assembled repair materials box and strip having a cross-section of trapezoidal shape and said tool box having a cross-section of trapezoidal shape complementary to the shape of the assembled repair materials box and strip, said tool box and said assembled materials box and strip occupying a space of rectangular cross-section when said tool box is piled on said assembled materials box and strip, said two covers covering, respectively, the top and bottom of the piled tool box and assembled materials box and strip.

3,917,107

REFUSE COMPACTOR STRUCTURE

Michael J. Bottas, Saint Joseph, and Robert W. Brooks, Benton Harbor, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Feb. 25, 1971, Ser. No. 118,860
Int. Cl.² B65D *25/14*
U.S. Cl. 220—65 **5 Claims**



1. In a refuse compactor having a substantially rigid compacting receptacle provided with an open top, means for providing facilitated disposition of refuse compacted in the receptacle, comprising: a flexible bag having an open portion adapted to be received in the receptacle with said open portion at said receptacle open top for receiving trash therethrough; and a cut-resistant, tough sheath removably inserted through said bag open portion defining a protective wall within said bag in the receptacle for effectively precluding damage to said bag over substantially its entire side walls as a result of compaction of refuse therein, said sheath being readily removable from said bag upon completion of compaction of refuse therein to permit the bagged compacted refuse to be removed from the receptacle with maintained integrity for facilitated disposal, said sheath comprising a tubular element formed of semi-rigid material and being provided with longitudinal fold lines providing adjustability of the transverse cross-section of the tubular configuration.

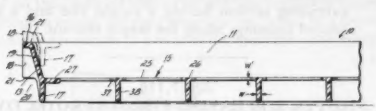
3,917,108

PLASTIC TRAY AND METHOD OF MAKING SAME

Paul G. Thurman, West Liberty, Ohio, assignor to Dare Plastics Inc., Urbana, Ohio

Filed Feb. 22, 1972, Ser. No. 228,122
Int. Cl.² B65D *7/32, 1/34*
U.S. Cl. 220—66 **5 Claims**

1. A molded plastic tray comprising
side walls and a bottom wall,
said bottom wall comprising an open gridwork of intersecting struts, at least some of said struts being T-shaped in cross section, said T-shaped struts having intersecting horizontal cross bars and vertical ribs, the cross bars of the T-shaped struts being located above the vertical ribs and forming the inside bottom surface of the tray, and



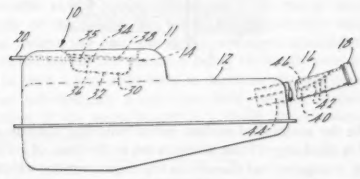
the vertical ribs of said struts being approximately twice the thickness in cross section of said horizontal cross bars and being substantially greater in height than the width of said cross bars so that during molding of the tray, the cross bars solidify before the vertical ribs and cause the struts to be prestressed into a rigid condition which effectively resists vertical deflection of the bottom.

3,917,109

EVAPORATIVE EMISSION CONTROLS

Donald C. MacDonald, Rochester, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed May 2, 1974, Ser. No. 466,120
Int. Cl.² B65D *25/00*
U.S. Cl. 220—85 VS **1 Claim**



1. A motor vehicle fuel tank assembly comprising:
a tank including an integral domed portion in its top for accommodating venting and fuel expansion,
a filler tube extending outwardly from the fuel tank, the tube having an opening positioned at substantially the same level as the maximum fuel level of the tank thereby providing a vapor space in the domed portion of the tank at a certain head of fuel in the filler tube when the tank is substantially full to a level immediately below the domed portion,
a single vapor vent conduit extending into the domed portion for receiving fuel vapor, and
vapor liquid separator means positioned only in the domed portion not extending downwardly into the tank proper, the separator means consisting of
elongated enclosure means having top, bottom and sides, the enclosure means being positioned lengthwise in the domed portion and adjacent the inner top of the domed portion with one end thereof lower than the other to facilitate liquid drainage therefrom, and being connected at the other end to the vapor vent conduit for collecting fuel vapors which subsequently exit through the conduit from the enclosure,
a relatively small opening in the bottom of the enclosure means at the lower end thereof for liquid fuel drainage, the size of the opening being such as to substantially prohibit splashing liquid fuel in the tank proper from entering the enclosure means, and
another relatively small opening in an upper portion of one of the sides of the enclosure means for communicating with the interior of the fuel tank and allowing vapor to flow between the enclosure means and the domed portion of the fuel tank thereby providing access for vapor to the vapor vent conduit via the enclosure means, the size of the opening being such as to

substantially prohibit splashing liquid fuel from entering the enclosure means, and

the vapor conduit having an end section thereof extending downwardly into the enclosure means to facilitate drainage of liquid fuel therefrom, the downwardly extending section having a closed end and a pair of spaced openings along the length thereof.

3,917,110

STOPPER ROD HAVING FIBROUS PROTECTIVE SLEEVE

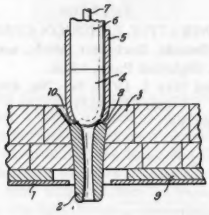
Asahi Kiguchi, Soja, Japan, assignor to Foseco International Limited, Birmingham, England

Filed June 26, 1974, Ser. No. 483,445

Claims priority, application Japan, Aug. 22, 1973, 48-94622

Int. Cl.² B22D *37/00*

U.S. Cl. 222—1 **6 Claims**



1. In the method of molten metal handling wherein molten metal is discharged from a nozzle set in the base of a vessel by raising a stopper rod therefrom the improvement which comprises providing on the stopper rod a covering sleeve, closely fitted on the end of the rod and contacting the nozzle, the sleeve being formed of a heat-insulating composition which resists thermal disintegration, said sleeve consisting essentially of, by weight, 45 – 94% particulate refractory material, 5 – 50% fibrous refractory material and 1 – 15% by weight binder.

3,917,111

APPARATUS AND METHOD FOR REGULATING MOLTEN METAL SUPPLY

Aristide Berthet, and Jacques Blum, both of Metz, France, assignors to Institut De Recherches De La Siderurgie Francaise (IRSID), 78-St. Germain-en-laye, France

Continuation-in-part of Ser. No. 413,662, Nov. 7, 1973, Pat. No. 3,856,182, which is a continuation-in-part of Ser. No. 230,746, March 1, 1972, Pat. No. 3,773,218. This application Aug. 22, 1974, Ser. No. 499,461

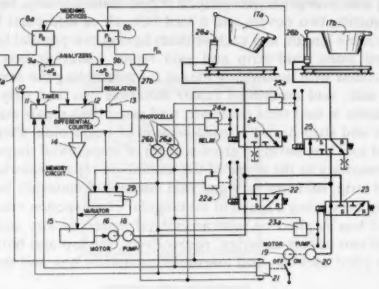
The portion of the term of this patent subsequent to Nov. 20, 1990, has been disclaimed.

Claims priority, application France, Mar. 2, 1971, 71.07098

Int. Cl.² B22D *37/00*

U.S. Cl. 222—1 **12 Claims**

1. A method of supplying a disired controlled flow of molten metal from at least two intermediate tipping vessels provided with means controlling their rate of tipping, comprising tipping one of said vessels that is full to obtain a discharge flow of metal, continuously weighing said one vessel as it is being discharged so as to determine the flow of metal running out of said vessel, comparing said flow of metal with a time varying reference quantity representing the desired flow of molten metal, developing from the comparison of determined flow and the reference quantity a differential signal corresponding to the difference in their values, modifying the tipping rate of said one vessel while metal is running out therefrom so as to bring said differential signal back to a substantially zero value, stopping the tipping of said one vessel while metal is running out therefrom, and initiating the tipping of the other vessel



that is full when the one vessel from which metal is running out reaches a perdetermined degree of emptying.

3,917,112

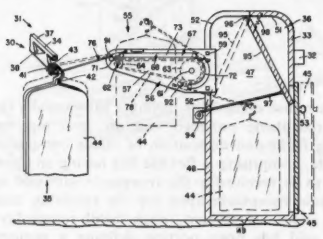
METHOD AND APPARATUS FOR CODED, SELF-SERVICE TRANSFER OF ARTICLES

Irving Willis, 6 Porter Road, Andover, Mass. 01810, and Bernd H. Walter, 191 Plainview Road, Woodbury, N.Y. 11797

Continuation-in-part of Ser. No. 299,951, Oct. 24, 1972, Pat. No. 3,840,103. This application Oct. 7, 1974, Ser. No. 512,960

Int. Cl.² G07F *11/58*

U.S. Cl. 221—1 **10 Claims**



8. The method of transferring dry cleaned garments suspended on conventional wire coat hangers on a halted endless conveyor into a locked immovable self service compartment by means of a track, carriage and pivoted transfer arm which comprises the steps of:

moving said carriage on said track in a compound curved path in a vertical plane, with said arm fixed against vertical movement thereon, up to said conveyor

then, pivoting said arm in a horizontal plane on said carriage to move the hooked terminal end thereof horizontally away from the hangers to be engaged as the carriage comes to a halt

then pivoting said arm in a horizontal plane in the reverse direction to engage the hooked terminal end under the cluster of hooks of said hangers on said conveyor

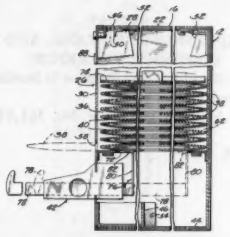
then moving said carriage in an upwardly inclined direction to lift said hooked end of said arm and thereby lift said hooks off said conveyor for retraction,

and then moving said carriage, arm and garments over to said compartment while describing a compound curve in a vertical plane to deposit the same in said compartment.

3,917,113
EJECTING DISPENSER FOR ARTICLES IN APERTURED ENVELOPES

Thomas R. Light, Milwaukee, Wis., assignor to Display Corporation International, Milwaukee, Wis.

Continuation-in-part of Ser. No. 446,152, Feb. 27, 1974, abandoned. This application June 6, 1974, Ser. No. 476,840
Int. Cl.² G07F *11/20*
U.S. Cl. 221—20 **21 Claims**



1. A coin-operated device for dispensing articles comprising, in combination:

envelope means for carrying each of the articles to be dispensed, said envelope means comprising a pair of substantially flat panels which are disposed in facing relation and are connected to each other along all but a portion of the edges thereof to define a pocket and an opening to said pocket for insertion of articles to be dispensed into said pocket and means defining an aperture in both of said panels;

a cabinet including means defining a storage compartment for receiving a stack of said envelope means and including a support wall against which said envelope means are stacked;

means defining a dispensing opening in general alignment with said support wall;

means defining an opening in said support wall and said envelope means being stacked on said support wall with the apertures in one of said panels facing toward and overlying said support wall opening and the closed edge of said envelope means facing toward said dispensing opening;

a coin acceptor mechanism supported from said cabinet and including a member located for movement relative to said support wall and said envelope means between an operating position remote from said dispensing opening and a dispensing position closer to said dispensing opening than the operating position; and

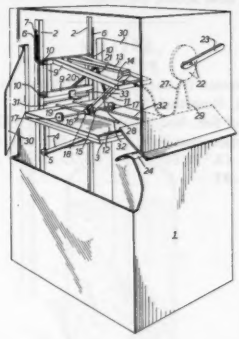
dispenser means for connecting said coin acceptor mechanism member to said envelope means and engageable in the panel aperture of said envelope means nearest said support wall to move said nearest envelope means with said coin acceptor member along said support wall and through said dispensing opening during movement of said coin acceptor mechanism member from the operating position toward the dispensing position.

3,917,114
NEWSPAPER VENDING MACHINE

Maurice Grosse, 25 Woodberry Crescent, London No. 10, England

Filed Jan. 30, 1975, Ser. No. 545,521
Claims priority, application United Kingdom, Jan. 30, 1974, 4422/74
Int. Cl.² B65G *59/00*
U.S. Cl. 221—251 **15 Claims**

1. A machine for dispensing newspapers and like articles, the machine comprising a platform for supporting a stack of newspapers, a carriage on which is mounted means for dispensing newspapers and the like one at a time from a stack thereof on said platform, a casing in which the platform, the carriage and the dispensing means are contained and mechanism operable from the exterior of the casing to cause the dispensing means to separate one newspaper from a stack thereof on the platform and to deliver the separated newspaper through a mouth-defining means in the casing to a location at which it is accessible to a user of the machine, wherein both

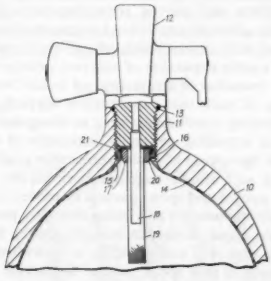


the platform and the carriage are upwardly and downwardly displaceable in the casing along guide rail means mounted internally of the casing, the weight of the carriage, said dispensing means, the platform and newspapers stacked on the latter in the use of the machine being resiliently counterbalanced in such a way as to tend to maintain the top of such a stack at substantially a constant level despite progressive diminution of the stack height as a result of successive dispensing operations.

3,917,115
DIVING CYLINDER WITH LINER

Arthur Travers, Corona del Mar, and Robert Leite, Garden Grove, both of Calif., assignors to AMF Incorporated, White Plains, N.Y.

Filed Mar. 15, 1974, Ser. No. 451,345
Int. Cl.² B65D *25/14*
U.S. Cl. 222—3 **2 Claims**



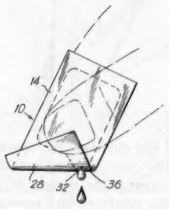
1. In a metallic air diving cylinder, a plastic bag lining the interior surface of said cylinder, and sealing means for the upper ends of said cylinder and bag to prevent ingress of moisture between said bag and cylinder, said cylinder having an upper open neck portion, said bag being slightly oversize with respect to said cylinder to conform thereto when inflated, said bag having an upper open neck portion, said sealing means sealing said two neck portions together and comprising essentially an annular member connected to the inside of each of said neck portions respectively, the annular member which

is inside the bag neck portion being seated in the other annular member whereby said bag neck portion is nested between said pair of annular members, the open neck portion of said cylinder being internally threaded, the annular member which is connected to the inside of said cylinder neck portion comprising an externally threaded plastic bushing, the annular member which is connected to the inside of said bag neck portion comprising a plastic plug, and said plastic plug and bag neck portion being heat sealed together.

3,917,116
PACKAGE

Edwin W. Mason, Wyckoff, N.J., assignor to Mason Keller Corporation, Roseland, N.J.

Continuation of Ser. No. 190,104, Oct. 18, 1971, abandoned. This application Feb. 1, 1974, Ser. No. 438,530
Int. Cl.[2] B65D *47/10, 65/32;* **B67D** *3/00*
U.S. Cl. 222—92 **1 Claim**

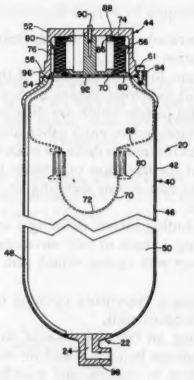


1. Package for shipping, storing and controlled dispensing of a unit or single use quantity of liquid, comprising, in combination, an absorbent resilient pad of a size easily compressed between the thumb and forefinger of a user and of a material which is nonreactive with such liquid; a unit or single use quantity of liquid absorbed within said pad; a pair of flexible generally rectangular sheets of metallic foil superposed one over the other one of said sheets having a recess pre-formed therein defining a generally rectangular pocket only slightly larger than said pad for containing said pad therewithin without compression to maintain such liquid absorbed within said pad during shipment and storage, the other of said sheets defining a cover extending across and covering said recess enabling compression of said pad and controlled expressing of said liquid from said pad by squeezing thereof between a user's thumb and forefinger without contaminating said liquid, said pad and said sheets being of sufficient resilience and flexibility to enable expansion of said pad, enlargement of said pocket and cessation of expression of liquid from said pad upon release of such user compression thereof, said recess further comprising a portion defining an elongated and narrow spout portion extending generally outwardly of said pocket, and means in the nature of a heat activatable coating hermetically sealing said sheets together peripherally completely around said pocket and spout portion to protect said pad and liquid from contamination and being manually peelable in the region of said spout to enable manual peeling back of said sheets in the region of said spout to a controlled extent less than the length of said spout portion to provide a restricted opening near the outboard end of said spout portion and an aseptic annular rim defined by a portion of said peeled sheets so that during expression of said liquid through said opening said liquid only touches material theretofore previously sealed to retain said liquid sterile as it is expressed outwardly through said spout portion and said opening and enabling the dispensed liquid to be readily visually observed during such dispensing by the user, said means for sealing forming a stop line which defines a generally straight line edge obliquely disposed relative the longitudinal axis of said pocket and generally perpendicular to the longitudinal axis of said spout portion, said spout being narrow and tapered outboard thereof to define a restricted dispensing nozzle upon outward bending of said outboard end portions of said sheets and parting of said sealed portion from the end of said spout portion to said straight line edge so that the outboard end portions of said sheets, upon being folded backwardly thereto, extend upwardly of said spout and out of the visual line to said opening to thereby provide further enhanced visual observation and control of the dispensing.

3,917,117
POSITIVE EXPULSION FUEL TANK, AND BLADDER DISPENSER THEREFOR

Norman Plotsky, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed May 21, 1973, Ser. No. 361,956
Int. Cl. B65d *35/22*
U.S. Cl. 222—94 **22 Claims**

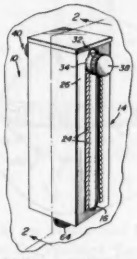


1. A fuel tank comprising,
a container including a shell defining a main fuel compartment and having a discharge port at one end,
means on the shell at the end thereof opposite the discharge port defining a bladder compartment communicable with the main fuel compartment,
a bladder unit including a bladder and bladder confining means,
the bladder being tubular and generally elongated when extended, and being contractible axially to a length greatly less than its extended length, and having folds in its contracted condition,
the bladder confining means engaging opposite ends of the bladder when the bladder is contracted, the bladder when contracted being disposed in the bladder compartment and the container having an inlet port adapted for introduction of fluid pressure therethrough into the bladder,
the bladder being responsive to fluid pressure therein of predetermined value greater than that in the fuel compartment and extendable by that greater pressure into the fuel compartment and being thereby operative for expelling the fuel from the fuel compartment, and the confining means being movable during such extension for releasing the folds singly from the end adjacent the bladder compartment.

3,917,118
TOOTHPASTE DISPENSER FOR DISPENSING PASTE FROM A COLLAPSIBLE TUBE

Royce G. Odgen, No. 28 Spring Oaks Road, Burleson, Tex. 76028

Filed July 15, 1974, Ser. No. 488,412
Int. Cl.[2] B65D *35/28*
U.S. Cl. 222—101 3 Claims



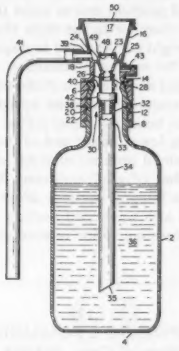
1. A toothpaste dispenser for dispensing paste from a collapsible tube, comprising, in combination:
a. a tube receiving housing provided with a slot;
b. a tube winding spindle arranged in the housing and having a portion extending out of the housing through the slot;
c. gear means arranged outside the housing for translating rotary motion imparted to the spindle into linear motion in a predetermined direction along the slot, the gear means including;
i. cogs disposed on an outer surface of the housing along opposite edges partially defining the slot;
ii. a spool mounted on the winding spindle and provided with teeth arranged on a face of the spool for engaging the cogs and forming a ratchet gear mechanism therewith; and
iii. spring means for resiliently biasing the spool toward the housing; and
d. the spool being hollow, and the spring means including a coiled spring disposed within the spool and a bushing having a pair of flanges, one of the flanges being disposed within the housing and the other of the flanges disposed in the spool, with the spring arranged abutting the other of the flanges and a wall of the spool.

3,917,119
SQUEEZE TYPE DEVICE FOR DISPENSING LIQUID MEDICAMENTS OR THE LIKE TO A BODILY ORGAN

Bruce E. Kahn, West Orange, N.J., assignor to Bel-Art Products, Inc., Pequannock, N.J.

Filed Nov. 1, 1974, Ser. No. 519,868
Int. Cl.[2] A61M *1/00*
U.S. Cl. 222—108 8 Claims

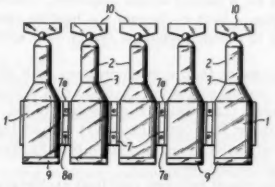
1. A squeeze type device for dispensing a liquid to a bodily organ, comprising:
a resilient container for the liquid having a closed bottom end and an open neck;
a cap engaged with the neck for closing the container and including an adapter for being in intimate contact with the organ, said adapter having an opening through which the liquid is dispensed upon the resilient container being squeezed;
a valve member supported within the cap and communicating with the adapter opening;
a tube communicating with the valve member and extending into the container through the liquid, and having an end near the bottom of the container:
the valve member including an aperture and means for blocking said aperture when the container is in the substantially upright position, with the liquid thereupon flowing through the tube and the valve member and through the adapter for being dispensed to the organ when the container is squeezed;
the aperture blocking means being gravity actuated when the container is tilted beyond a predetermined angle, whereupon the liquid flows beyond the end of the tube near the bottom of the container, for unblocking the aperture, with the liquid flowing through said aperture into the valve member and through said valve member and adapter opening for being dispensed to the organ when the container is squeezed;
a tubular member near the bottom of the adapter and communicating therewith, and extending substantially normal thereto; and
a substantially right angular drain tube communicating with the tubular member and rotatable about said member for draining residual liquid from the adapter independent of the position of the container.



3,917,120
SINGLE USE CONTAINER FOR LIQUID PHARMACEUTICAL COMPOSITIONS

Joachim Larenz; Theodor Schwarz, and Erich Köbel, all of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit Beschraenkter Haftung, Darmstadt, Germany

Continuation of Ser. No. 304,667, Nov. 8, 1972, abandoned.
This application June 6, 1974, Ser. No. 476,782
Claims priority, application Germany, Nov. 11, 1971, 2155993
Int. Cl.[2] B67D *5/56*
U.S. Cl. 222—129 1 Claim



1. An assembly of a plurality of single-use, multiple dose unitary containers for liquids, adapted for dispensing measured doses of liquid therefrom, formed in one unitary piece from an elastic polymer, each container having a larger lenticularly flattened compressible lower end providing a main chamber and an elongate cannular shaped upper end providing a separate measuring chamber of smaller volume than the

main chamber for containing only a single dose of specific volume, each said container having a sealed upper end, with a severable member forming a part of and extending from the sealed upper end and adapted to form a liquid dispensing aperture in the sealed upper end when the severable member is severed therefrom, and having the lower end joined to the upper end of the main chamber and communicating therewith by a constricted orifice defined by a toothed, wheel-like configuration for permitting the flow of liquid from the main chamber into the measuring chamber when the container is shaken in an inverted position and to resist the flow of liquid from the measuring chamber to the main chamber when the container is in an upright position and to dispense a measured dose of liquid from the measuring chamber when the severable member is severed and the walls of the main chamber are squeezed while the container is in an upright position, said plurality of containers being severably joined in a single plane along the sides of the lower larger end of the containers and forming a predetermined number of doses of said fluid and said severable member of each container being formed as flattened, tongue-like integral portions adapted to be broken from the sealed end at a weakened portion of the severable member at a point forming, prior to severance, the seal for said aperture.

3,917,121

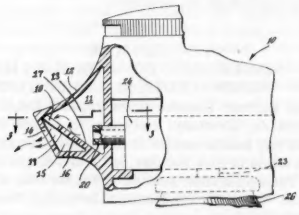
SPOUT FOR DISPENSING A FOAMABLE PRODUCT

John T. Ciaffone, Bridgeport, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.

Continuation of Ser. No. 398,103, Sept. 17, 1973, abandoned, which is a continuation-in-part of Ser. No. 249,895, May 3, 1972, abandoned. This application July 29, 1974, Ser. No. 492,551

Int. Cl.[2] B67D *5/62*

U.S. Cl. 222—146 HA **7 Claims**



1. A spout for a heated cream dispenser, wherein said dispenser includes a heat exchanger for heating cream passing therethrough to a heat exchanger outlet, said spout comprising:

a spout cavity in fluid communication with said heat exchanger outlet, said spout cavity having a cross-sectional area greater than said heat exchanger outlet,

a spout outlet in fluid communication with said spout cavity, said spout outlet being spaced outwardly from said heat exchanger outlet, and

a baffle interposed between said heat exchanger outlet and said spout outlet, and extending upwardly and outwardly from said heat exchanger outlet for deflecting all of the heated cream, and for dividing said spout cavity into an expansion chamber above an upper surface of said baffle and a retraction chamber below a lower surface of said baffle,

said baffle having an aperture at an upper end thereof, and said aperture having a cross-sectional area greater than said heat exchanger outlet.

3,917,122

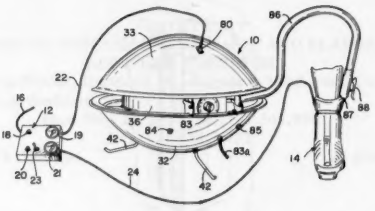
HEATING DEVICE FOR CUSTOM FITTING A SKI BOOT

Jack C. Swan, Jr.; Donald W. Bertetto, and Chris A. Hanson, all of Boulder, Colo., assignors to Hanson Industries Inc., Boulder, Colo.

Filed Mar. 4, 1974, Ser. No. 447,519

Int. Cl.[2] B05C *9/02*

U.S. Cl. 222—146 HE **13 Claims**



1. A heating unit for heating a fitting material for use in making custom fitted ski boots wherein a ski boot is provided with an inner liner and an outer shell and said liner provides a cavity adapted to receive the fluid fitting material, said heating unit comprising:

a rounded heat-conducting heating pot and a sealing cover member, and said pot and cover being encapsulated within a thermally insulating shroud having upper and lower housings;

said heating pot having a bottom and sides extending upwardly therefrom;

said heating pot having a heating chamber and an air supply connector to provide pressure in said heating chamber, an electric heating element attached to said heating pot and in heat conducting relationship therewith for melting said fitting material variations

said heating pot also including integral heat transferring fin means in said heating chamber for conducting heat into the heating chamber to melt and provide a heated fluid fitting material;

locking means for securely attaching the cover member to the heating pot and said locking means including connecting means selectively operable for releasably attaching said cover member atop the heating pot; and,

outlet means including an exit duct in said melting pot and an outlet feed line for transferring heated fluid fitting material from the heating unit.

3,917,123

ADHESIVE BLOCK

Julian Pascoe Grenfell, Pyrford, England, assignor to Sale Tilney AG, Zug, Switzerland

Filed Mar. 18, 1974, Ser. No. 452,381

Claims priority, application United Kingdom, Jan. 14, 1974, 1629/74

Int. Cl.[2] C09H *11/00*

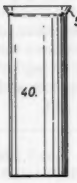
U.S. Cl. 222—146 HE **9 Claims**

1. A solid adhesive block made of hot-melting material for use in an adhesive dispenser of the kind including a feed passage, a dispensing outlet for dispensing adhesive in substantially liquid form, means for supplying pressurised fluid for advancing the block along the feed passage towards the dispensing outlet, and means for melting a part of the block before it reaches said outlet, wherein the improvement in said adhesive block comprises:

at least one integral flange formed on the block and dimensioned so as to constitute a resiliently yielding seal in said feed passage,

at least a part of the rear end of the block relative to its direction of advance in use, being formed as a piston face for the direct application of pressurised fluid thereto, and

a recess defined between said flange and a central portion of the block, which central portion constitutes the piston



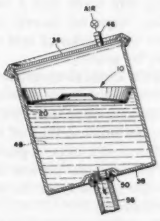
face, whereby in use pressurised fluid will enter into said recess to force the resilient flange towards its sealing position.

3,917,124

FOLLOW PLATE FOR DISPENSING MATERIAL

David E. Kifer, Parma, Ohio, assignor to Oatey Co., Cleveland, Ohio

Division of Ser. No. 243,616, April 13, 1972, Pat. No. 3,790,038. This application Sept. 10, 1973, Ser. No. 395,620
Int. Cl.² B67D *5/42*
U.S. Cl. 222—386 **7 Claims**



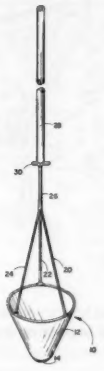
1. In combination, a generally cylindrical receptacle for flowable products having upper and lower ends and a follow plate slidably received within said receptacle, said follow plate comprising a generally annular disc having a tapered peripheral flange extending axially upwardly and radially outwardly therefrom, said flange being made of a flexible plastic material and having a major diameter sufficiently greater than the inner diameter of said receptacle to remain in sliding sealed engagement with the inner wall of the receptacle during axial movement of said follow plate therewithin toward the lower end of said receptacle, and a minor diameter which is at least one-half inch less than said major diameter to provide a clearance space at the minor flange diameter at least one-fourth inch all the way around said follow plate for clearing any dents or bumps on such inner wall, said flange having a taper in excess of 10° to permit substantial cocking of said follow plate within said receptacle while still maintaining line contact between said flange at the major diameter thereof and the inner wall of said receptacle to avoid wedging of said follow plate within said receptacle.

3,917,125

APPARATUS AND METHOD FOR DISPENSING MATERIALS INTO A MELT COMPOSITION

David M. Heinz, Orange, and Frederick S. Stearns, Placentia, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 1, 1974, Ser. No. 457,032
Int. Cl.² B65D *5/58;* **A47G** *19/14;* **C21C** *7/00*
U.S. Cl. 222—189 **4 Claims**



1. A dispenser assembly comprising:
a container having an opening and means for accommodating material to be precisely dispensed;
said container having an inverted cone-shaped configuration with said opening at the apex thereof;
porous means adjacent said opening whereby said porous means may be selectively sealed for holding material in either the solid or the liquid state and selectively unsealed to permit said material to be dispensed through said opening of said container:
means for supporting said container;
said means for supporting said container consisting of a plurality of arms attached to said container,
a vertical arm connected to said plurality of arms,
a cross member connected to said vertical arm, and
a hollow rod for lowering and raising said container fitted over said vertical arm and attached thereto so that said cross bar acts as a stop for said hollow rod.

3,917,126

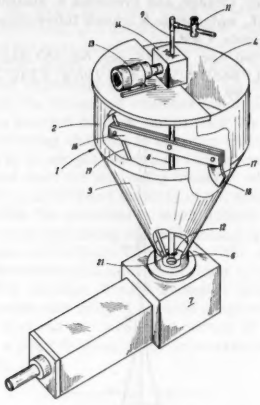
FEEDING DEVICE

William H. Beach, 912 Greenwood Court, New Albany, Ind. 47150

Filed July 16, 1974, Ser. No. 488,979
Int. Cl.² B65G *3/12*
U.S. Cl. 222—195 **9 Claims**

1. A feeding device for feeding non-free flowing powdery material comprising: a hopper having an inlet and an outlet; a movably mounted vertically extending hollow shaft having an inlet and an outlet, said shaft being disposed concentrically within said hopper, and driven by motor driving means, said shaft inlet being in fluid communication with an air supply means, said shaft outlet being adjacent said hopper outlet, said air supply means providing an air flow through said shaft outlet circumferentially around said hopper outlet upon movement of said hollow shaft; a horizontally extending member attached to said movably mounted shaft, said horizontal member having a blade means attached to one end thereof, said blade means being spaced from and adjacent to the inner wall of said hopper whereby upon movement of said hollow shaft said blade means prevents build up of feed material on the inner walls of said hopper; and, a downwardly extending

member attached to said horizontally extending member, said downwardly extending member having a tip at its lower extremity adjacent to said hopper outlet, said tip moving circumferentially around said hopper outlet upon movement of said hollow shaft.



3,917,127

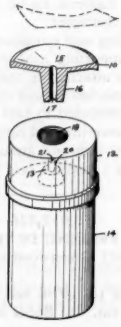
AEROSOL CAN AND ACTUATING CAP

Arthur Z. Berenstain, Erie, Pa., assignor to Larson Laboratories, Inc., Erie, Pa.

Continuation of Ser. No. 226,906, Feb. 16, 1972. This application Nov. 2, 1973, Ser. No. 412,484

Int. Cl.[2] B65D *83/14*

U.S. Cl. 222—402.13 **1 Claim**



1. In combination, an aerosol can, a cap, and an actuator, said cap being generally cylindrical in shape,

said aerosol can having a valve adapted to be depressed,

an opening in said cap above said valve,

said actuator having an enlarged member in the form of a circular disk having a diameter substantially equal to the diameter of said cap,

said disk having a top surface,

said top surface of said disk being defined by a concave surface substantially over its entire top and in the form of a part of the surface of a sphere,

a frusto-conical member attached to said enlarged member and extending downward through said opening in said cap,

a hollow in said frusto-conical member receiving said valve, said hollow receiving an end of said valve,

the base of said frusto-conical member having a diameter substantially equal to the diameter of said opening in said cap,

said opening receiving said frusto-conical member whereby when said frusto-conical member is depressed it depresses said valve actuating said valve and said valve dispenses material from said can through said hollow in said frusto-conical member, on to a pad adapted to be supported on said concave surface,

said concave surface being adapted to support a pad whereby fluid passing from said valve through said hollow is deposited on said pad.

3,917,128

WIND OPERATED ADJUSTABLE BIRD FEED DISPENSER

Floyd Luke Terry, P.O. Box 6602, Shreveport, La. 71106

Continuation of Ser. No. 184,824, Sept. 29, 1971, abandoned. This application Dec. 5, 1973, Ser. No. 421,862

Int. Cl. G01f *11/24*

U.S. Cl. 222—410 **13 Claims**

1. A self-dispensing feeder comprising:

a container having side walls and a bottom, said bottom having an orifice disposed therein for permitting feed positioned within the interior of said container to fall out of said container by gravity;

an axially adjustable conical member connected to said container and coaxially disposed within said orifice for restricting the opening of said orifice, said conical member having an upper portion thereof extending above the plane of the orifice and a bottom portion thereof extending beneath the plane of the orifice, said conical member having at least one surface slot therein extending along the slant height thereof;

motor means connected to said conical member for rotating said conical member within said orifice to facilitate the flow of feed between the exterior surface of the conical member and the interior periphery of said orifice; and

said orifice being fashioned with at least one recessed tooth in the peripheral edge thereof, said at least one tooth being provided with a sharp bite edge for engaging grains of feed carried by said at least one surface slot for fracturing oversized grains to permit the grain to pass between the outer periphery of said conical member and the inner periphery of said orifice.

3,917,129

DOSAGE CAP AND CONTAINER FOR POWDERS OR LIQUIDS

Claudio Cavazza, Rome, Italy, assignor to SIGMA-TAU Industrie Farmaceutiche Riunite S.p.A., Italy

Filed Jan. 28, 1974, Ser. No. 437,199

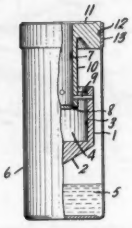
Claims priority, application Italy, Jan. 31, 1973, 47981/73

Int. Cl.[2] G01F *11/26*; B65D *39/04*

U.S. Cl. 222—454 **4 Claims**

1. A metering cap for a bottle for metering a liquid or a powder contained in a bottle, said metering cap comprising a closure portion for closing a bottle in which a liquid or powder

is contained and a portion thereof from which it is to be delivered in metered quantities, said closure portion having a central opening, a conduit fixed to said closure portion in communication with said opening and extending away from said opening in a direction for extending away from said opening in a direction for extending into the bottle, said closure portion having a larger transverse dimension than the transverse dimension of said conduit, said conduit having an open free end, a container fixed to said conduit spaced from said closure portion and defining a metering chamber disposed circumferentially spaced from the free end of the conduit and in communication with said free end, said container having an opening into which said free end of said conduit extends and into said metering chamber, said open free end being spaced from the bottom of said metering chamber, whereby when said bottle is inverted and then moved to a rightside up position said metering chamber is filled with contents from said bottle and upon subsequent inversions the contents from the metering chamber are delivered from the bottle and upon positioning rightside up of the bottle contents again fill the metering chamber, and said contents are metered outwardly of said bottle and said metering chamber subsequently filled upon each inversion of the bottle.



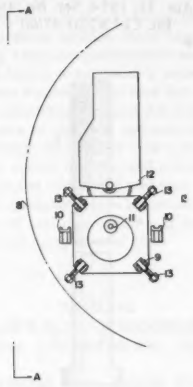
3,917,130

MOUNTING STRUCTURE FOR SLIDING NOZZLE UNIT

Tetsu Nigorikawa, Fukuyama; Masanori Sakai, Hiroshima, and Masayoshi Nakajima, Okayama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha; Kokankikai Kogyo Kabushiki Kaisha and Tokyo Yogyo Kabushiki Kaisha, all of Tokyo, Japan

Filed Feb. 11, 1974, Ser. No. 441,513
Claims priority, application Japan, Feb. 12, 1973, 48-17513
Int. Cl.[2] B22D *37/00, 41/08*
U.S. Cl. 222—555 **2 Claims**

1. A mounting structure for supporting a sliding nozzle unit on a ladle having a pair of spaced guide arms projecting from a lower portion of said ladle, said nozzle unit comprising a housing, said guide arms extending each on opposite sides of said housing; a roller being mounted on each of said two opposite sides of said housing, each said roller being rotatable on respectively one of said guide arms for moving said nozzle unit towards and away from said ladle; and cooperatively engaging means on said housing and ladle for fastening said nozzle unit onto said lower portion of said ladle.

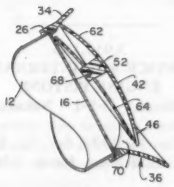


3,917,131

SELF-CLOSING CAP WITH A POURING SPOUT FOR CONTAINERS SUCH AS CANS AND THE LIKE

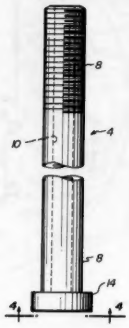
Myron M. Levin, Niles, Ill., assignor to E-Z Por Corporation, Niles, Ill.

Filed Sept. 23, 1974, Ser. No. 508,678
Int. Cl.[2] B65D *47/20*
U.S. Cl. 222—556 **10 Claims**



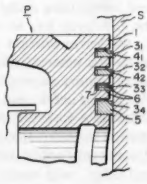
1. A self-closing cap adapted for detachable securement to a can or container and comprising a cap body and an annular disk and in which the cap body has an annular lower wall or band or skirt forming the lower portion of said cap body, said lower portion having means whereby the cap body is detachably secured to the container, an upper wall extending upwardly of the annular lower wall, said upper wall having a spout at the front thereof, a top wall connected to said cap body and provided with a cutout adjacent said spout to form an outlet opening adjacent said spout, said annular disk having an annular peripheral edge, said annular disk positioned in said cap body below said top wall, means for pivotally connecting said disk to said top wall at a point intermediate the front and rear of the disk and inwardly of the peripheral edge of the disk so that when the container is tilted to pouring position the disk will automatically pivot with respect to said outlet opening to permit passage of the container contents through said outlet opening and said spout, and adapted when the container is positioned in upright position to move by gravity to a position to close said outlet opening.

3,917,132
LADLE STOPPER ROD
James H. Beijen, Glenwood, Ill., assignor to Fabsco Corporation, Lansing, Ill.
Filed Apr. 11, 1974, Ser. No. 460,181
Int. Cl.² B22D *37/00*
U.S. Cl. 222—559 **2 Claims**



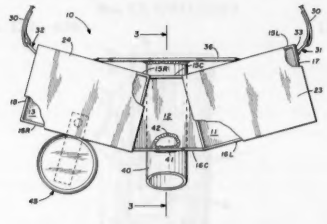
1. A steel stopper rod for bottom pour ladles, including
an elongated steel shank member,
mounting threads formed at one end of said shank member,
a separately formed steel stopper head laterally extending beyond the shank member and dimensioned to close a bottom pour ladle opening,
a threaded mounting bore extending to the opposite ends in said head and having a configuration corresponding to the outside configuration of the threaded end of the shank member so that the head of said shank member engages said mounting bore, and
a continuous weld sealingly fastening the head to the outside of the shank member at the junction between the bottom end of the shank member and the bottom of the mounting bore.

3,917,133
GAS SEALING DEVICE FOR INTERNAL COMBUSTION ENGINE PISTONS
Shigekado Sakakibara, 3-8-1 Nakakaigan, Chigasaki, Kanagawa, Japan
Filed Mar. 18, 1974, Ser. No. 452,378
Claims priority, application Japan, Mar. 20, 1973, 48-32004
Int. Cl.² F02F *5/00*
U.S. Cl. 123—193 P **2 Claims**



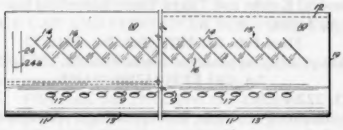
1. In an internal combustion engine having at least one reciprocable piston with a plurality of annular grooves therein and compression and oil rings positioned within respective upper and lower ones of said grooves, the combination of at least one additional annular groove intermediate said upper and lower grooves, at least two auxiliary split rings mounted in overlying relation within each of said additional grooves, each of said split rings being circumferentially extending and having a radially extending gap between the free ends thereof, the split rings in each said additional groove being positioned such that their radial gaps are circumferentially displaced relative to each other and out of axial alignment, each of said auxiliary split rings being extremely thin relative to the thickness of said compression rings and the combined thickness of the auxiliary split rings within any of said additional grooves being less than the thickness of any one of said compression rings.

3,917,134
PERSONAL FISHING CARRIER
Alvin L. Tumlinson, 2202 Rountree Drive, Austin, Tex. 78722
Filed Dec. 6, 1974, Ser. No. 530,239
Int. Cl.² A45F *5/00*
U.S. Cl. 224—5 E **7 Claims**



1. A fishing carrier comprising
an elongated body substantially conforming to a wearer's body, having a generally arcuate inner wall to bear against the wearer's body; said body providing a plurality of upward opening compartments for the storage of fishing tackle and accessories;
means on said body for securing same at the waist of the wearer;
an apron plate secured to said carrier body centrally of said inner wall and depending therebelow, to bear against the wearer's body for supporting said carrier body in a generally horizontal orientation;
means secured to the underside of said carrier body defining an elongated socket, extending in an inclined attitude generally upwardly and away from the wearer to receive and support a fishing rod;
and said socket means being mounted centrally of said carrier body and being secured at its rearward end to said apron plate.

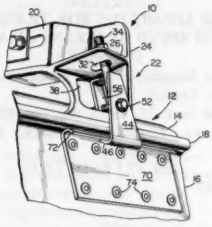
3,917,135
CARTRIDGE HOLDER
George L. Christensen, 624 N. 1st West, Tremonton, Utah 84337
Filed May 29, 1973, Ser. No. 364,943
Int. Cl.² F42B *39/02*
U.S. Cl. 224—14 **3 Claims**



1. The method of storing an ammunition cartridge having a projectile, on a flexible panel to be worn on the person, comprising:

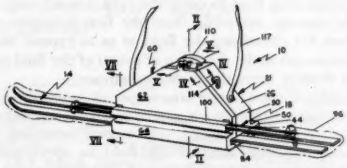
cutting a hole in the panel;
making a retaining strap by cutting a pair of parallel slits in the panel obliquely to the direction from the center of the strap to the hole;
inserting the cartridge between the strap and the panel with the projectile end thereof toward the hole; and
rotating the cartridge so that the end of its projectile may be inserted into the hole, whereby a twist is induced in the strap so that it grips the cartridge tightly during storage.

3,917,136
VEHICLE RACK MOUNTING MEANS
Miles Thomas Carson, 1120 10th St., Denver, Colo. 80204
Filed May 8, 1974, Ser. No. 468,141
Int. Cl.[2] B60R *9/00*
U.S. Cl. 224—42.1 F **7 Claims**



1. A mounting assembly for a vehicle roof mounted rack removably fastened to a vehicle gutter rail comprising a rigid plate having a substantial extended surface portion and terminating along one edge thereof in a J-shaped terminus, said rigid plate adapted to be secured to a vehicle at each rack attaching site with the J-shaped terminus in contact with the vehicle gutter rail and a gutter rail clamp member including an adjustable J-hook and a presser foot engaging therebetween the J-shaped terminus of the rigid plate and the vehicle gutter rail.

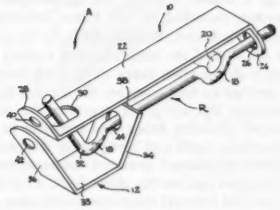
3,917,137
SKI EQUIPMENT CARRYING APPARATUS
Douglas S. Wilkins, 11417 Thornridge Road, Oklahoma City, Okla. 73120
Filed Mar. 14, 1974, Ser. No. 451,039
Int. Cl.[2] B65D *71/00*
U.S. Cl. 224—45 S **33 Claims**



1. A case for carrying various ski equipment, including skis and ski boots, together in a single package comprising means for enclosing and carrying a pair of ski boots, said means having a pair of external surfaces defining ends of said anchoring means; means for carrying a pair of skis adjacent said ski boot enclosing means including means for covering and supporting at least a central portion of said skis to support the skis with the case and to protect any bindings mounted thereon; the pair of skis, when supported by said carrying means, having their tip and heel portions extending beyond said external surfaces of said boot enclosing means; closure means providing access to said boot enclosing and ski-carrying means for insertion and removal of said boots and skis therein; and means for lifting and carrying said case whereby said case can be manually carried with said lifting and carrying means or attached to a vehicular ski carrier by said extending ski portions.

27. A rigid carrying case for ski boots, ski poles, skis, and other skiing equipment molded from high-impact resilient plastic comprising a first compartment for enclosing and holding a pair of ski boots; a partition; a second compartment separated from and located below said first compartment by said partition for supporting a pair of skis and generally covering the central area of the skis and any bindings mounted thereon; a cover hingedly secured over a side of both of said compartments for access thereto; and means for attaching a pair of ski poles on the exterior of said case; said pole-attaching means including release means for releasing the poles only from the interior of said case when said cover is open; and means for lifting and carrying said case.

3,917,138
BICYCLE LOCKING AND SECURING DEVICES
Gregory B. Bergeron, 3631 Midvale Ave., Apt. 6, Los Angeles, Calif. 90034
Filed Oct. 21, 1974, Ser. No. 516,401
Int. Cl.[2] B62D *43/00*
U.S. Cl. 224—42.03 B **14 Claims**



1. A device for removably securing a pedaled self-powered vehicle having a main cross-bar to a rod member extending from an engine-powered vehicle, said device comprising:
a. a first bracket comprising:
1. a first plate extending generally with respect to the axial direction of said rod member,
2. a first flange on said first plate extending outwardly in a first direction from and at an oblique angle with respect to said first plate,
3. a second flange on said first plate extending outwardly in a second direction from and at an oblique angle with respect to said first plate and where the second flange is generally parallel to said first flange, and
4. means forming first and second apertures in said first plate and said first flange to removably receive said rod member, and
b. a second bracket comprising:
1. a somewhat U-shaped member including a second plate and third and fourth outwardly extending flanges extending from said second plate,
2. means forming a cooperating aperture in the third flange of the somewhat U-shaped member to removably receive a portion of the rod member, and
3. cooperating locking means associated with said second flange and said fourth flange to provide a locking action therebetween.

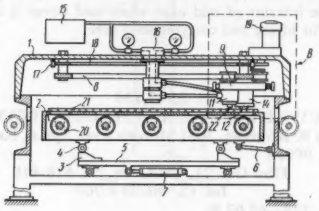
3,917,139
APPARATUS FOR CUTTING SHAPES OUT OF GLASS SHEETS

Nikolai Pavlovich Kabanov, Naberezhnaya Sheuchenko, 3, korpus 3, kv. 50, Moscow; Vitaly Sergeevich Schukin, Leninsky prospekt, 72, kv. 500, Moscow; Sergei Fedorovich Makhalov, ulitsa Shkolnaya, 5, kv. 10, Bor Gorkovskoi oblasti; Jury Alexeevich Knyazev, ulitsa Shkolnaya, 1, kv. 16, Bor Gorkovskoi oblasti; Dmitry Nikolaevich Savonichev, ulitsa Shkolnaya, 4, kv. 8, Bor Gorkovskoi oblasti, and Vladimir Nikolaevich Suvorov, ulitsa Shkolnaya, 2, kv. 6., Bor Gorkovskoi oblasti, all of U.S.S.R.

Filed Jan. 22, 1975, Ser. No. 543,040

Int. Cl.² B26F *3/00*

U.S. Cl. 225—96.5 **3 Claims**



1. An apparatus for cutting shapes out of glass sheets with formation of a through-going crack along the line of cutting out, comprising: a frame; a table, for accommodation of a glass sheet thereon, mounted on said frame; a template likewise mounted on this frame, equidistant from the contour of a shape to be cut out of the glass sheet; a cutting head for making a scratch in the glass sheet along said contour, said head being supported by said template for motion therealong; means for making a through-going crack in the glass sheet along said contour, movable along said template in synchronism with said cutting head and comprising a tubular guideway and a spherically shaped pressure member received in said guideway to press against the glass sheet; a casing having an internal space, said internal space communicating with said tubular guideway; and a source of pressurized fluid communicating with said internal space of said casing to press said member against said glass sheet.

3,917,140
PROCESS FOR TRANSFORMING CONTINUOUS SYNTHETIC FIBRE STRIP INTO CUT STRIP AND APPARATUS FOR CARRYING OUT THE PROCESS

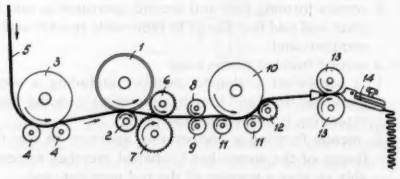
Carlo Degli Antoni, Lentiai(Belluno), Italy (32020), and Francesco Pellegrini, via Dante 8, Codogno(Milan), Italy (20075)

Filed Apr. 16, 1973, Ser. No. 351,412

Claims priority, application Italy, Apr. 19, 1972, 23381-A/72

Int. Cl.² B26F *3/00*

U.S. Cl. 225—100 **6 Claims**



1. An apparatus for transforming continuous synthetic fiber strip into cut strip suitable for feeding spinning machines of the wool or cotton type, comprising a processing line for the strip including a feeding zone, for the strip, a cutting zone therefor, a stretching and tearing zone for the strip and a transfer zone therefor, wherein the cutting zone for the strip has a helical knife for the continuous incision of the fibers, said helical knife consisting of an incisions making roller cooperating with anvil means and having a surface of circular cross-section, said surface having a central area and two areas adjacent to said central area, said roller comprising helical cutting projections disposed in said two adjacent areas in which said projections are of opposite inclination and converge as a cusp towards said center area, thereby to provide continuously in the strip fibers differently oriented incisions with a transverse inclination thereof and to provide stretching and tearing actions in the zones subsequent to the cutting zone.

3,917,141
PROCESS AND APPARATUS FOR TRANSPORTING THE YARN AT HIGH SPEED BY MEANS OF A FLUID UNDER PRESSURE

Rolland Sartori, Roanne, France, assignor to Rhone Poulenc Textile, Paris, France

Filed Sept. 25, 1973, Ser. No. 400,563

Claims priority, application France, Sept. 25, 1972, 72.34460

Int. Cl.² B65H *17/32*

U.S. Cl. 226—97 **5 Claims**

1. Apparatus for transporting a yarn downstream of a yarn drawing assembly comprising:

a first induction nozzle means for initially entraining the yarn in a stream of fluid to apply tension on the yarn and pull the yarn from the drawing assembly while providing an expanding fluid to carry the yarn downstream;

a fluid passage extending from the first induction nozzle means for containing the fluid so as to expand the fluid downstream in the direction of extent of the fluid passage and thereby carry the yarn downstream;

a second induction nozzle means spaced downstream of the fluid passage to define a gap between the second nozzle means and fluid passage, said second induction nozzle means receiving just enough fluid to apply sufficient tension on said yarn to hold said yarn taut in said gap;

winding means movable through said gap to capture the yarn and wind the yarn thereabout while applying sufficient tension on the yarn to wind the yarn thereabout; and

lateral aperture means disposed in the fluid passage between the ends thereof, said aperture means dividing said passage into upstream and downstream portions and said aperture discharging laterally a portion of the stream of fluid while the yarn is transported solely by the remaining fluid through the downstream portion and to the second induction nozzle means, thereby reducing the amount of fluid that must be injected into the second nozzle means to hold the yarn taut when the yarn is not being wound on said winding means while allowing said first nozzle means

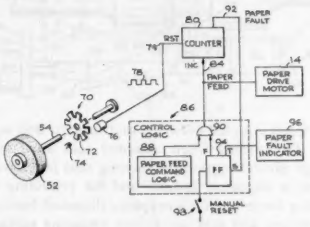
to receive enough fluid to pull the yarn from the drawing assembly.

3,917,142

PAPER MOTION SENSOR APPARATUS

Fernando V. Guarderas, Woodland Hills, Calif., assignor to Data Products Corporation, Woodland Hills, Calif.

Filed Apr. 4, 1974, Ser. No. 457,773
Int. Cl.² B65H *23/10*
U.S. Cl. 226—38 **5 Claims**



1. In a printer including (1) control means for periodically generating paper feed command and (2) drive means responsive to said commands for moving a paper web along a prescribed path, the improvement comprising:

friction wheel means tangentially engaged with said paper web for rotating in response to linear movement of said paper web;

transducer means for generating a pulse in response to each unit of rotation of said friction means;

counter means for counting the number of paper feed commands supplied by said control means;

means responsive to each pulse generated by said transducer means for resetting said counter means;

said counter means including means for generating a fault signal in response to a predetermined number of paper feed commands occurring between successive pulses generated by said transducer means; and

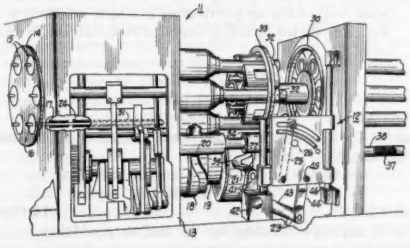
means responsive to said fault signal for inhibiting generation of said paper feed commands.

3,917,143

ADJUSTABLE STOCK FEED

David T. Yourkievitz, Eastlake, Ohio, assignor to Acme-Cleveland Corporation, Cleveland, Ohio

Filed May 11, 1973, Ser. No. 359,271
Int. Cl.² B23Q *5/22*
U.S. Cl. 226—141 **15 Claims**



1. An adjustable stock feed for bar stock for a spindle of an automatic bar machine tool comprising in combination, a stock feed pusher to feed bar stock into the spindle,

first cam and follower means,

second cam and follower means,

linkage means connecting said first cam and follower means in series through said second cam and follower means to said stock feed pusher,

said first cam and follower means establishing a fixed stroke of movement of said stock feed pusher,

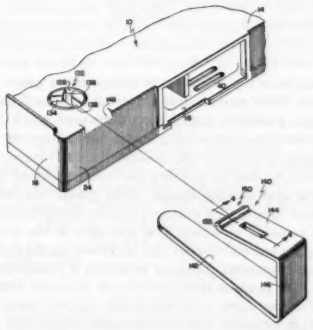
and means to adjust the angle of one of said second cam and follower means relative to the machine tool to vary the stroke of relative movement of said second cam and follower means to adjust the stroke of said stock feed pusher.

3,917,144

ADAPTER APPARATUS FOR A FILM-HANDLING CASSETTE

Fred M. Finnemore, North Reading, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed May 6, 1974, Ser. No. 467,075
Int. Cl.² B65H *23/08*
U.S. Cl. 226—195 **32 Claims**



1. An adapter for attachment to a photographic film cassette prior to the cassette being inserted into a camera or projector, the cassette including a housing, means for defining an exposure or projection station, an elongated film strip, means responsive to externally mounted actuating means for facilitating the progressive advancement of the film strip across the exposure or projection station, and means responsive to an external force applying member for imparting a snubbing action to the film strip at a predetermined location within the cassette housing as the film strip is progressively advanced across the exposure or projection station, the snubbing action imparting means normally being in an initial condition wherein it is inoperative to impart the snubbing action to the film strip and arranged and structured to be rendered operative to impart the snubbing action to the film strip when the external force applying member is operably associated therewith, said adapter comprising:

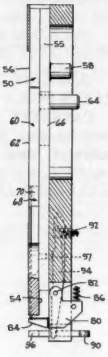
a force applying member; and

means engageable with the cassette and operably associated with said force applying member for releasably attaching said force applying member to the cassette housing in a predetermined orientation in which said force applying member automatically renders the caassette's snubbing action imparting means operative prior to inserting the cassette into the camera or projector.

3,917,145
STAPLING MACHINE PARTICULARLY ADAPTED FOR USE IN LIMITED CLEARANCE APPLICATIONS

Arthur Graf, 323 W. 43rd St., New York, N.Y. 10036, and Richard A. Graf, 627 Maple St., River Vale, N.J. 07675

Filed Mar. 7, 1974, Ser. No. 449,143
Int. Cl.² B27F 7/16
U.S. Cl. 227—90 9 Claims



1. A machine for repetitively deforming a piece of stock, after it has been moved along a predetermined path into a deformation position, and driving deformed stock into work engaging position, comprising means for deforming pieces of stock, means for driving said deformed stock into work engaging position, means for guiding movement of said deforming means and said driving means along paths intersecting the path of said stock, first support means movable between an extended position in which it is disposed in the path of said deforming means and cooperates therewith in the deformation of stock and retracted position in which it is withdrawn from said path and permits deformed stock to move freely in the direction of the work, and additional support means located in a position between said first support means and a portion of the work to receive said deformed stock, in such position said additional support means furnishes support for said deformed stock in conjunction with said first support means as said stock is moved toward work engaging position and constitutes sole support for said stock after said first support means has been moved toward its retracted position and said stock is in contact with said work, said first support means and said additional support means both being arranged within said machine so that they are on the same side of said deformed stock thereby enabling said machine to be disposed in close relationship to the work during the entire stock deformation procedure.

3,917,146
PORTABLE VIBRATORY WELDING APPARATUS

Donald R. Culp, Danbury, Conn., assignor to Branson Ultrasonics Corporation, New Canaan, Conn.

Filed Apr. 4, 1975, Ser. No. 565,237
Int. Cl.² B23K 1/06, 5/20
U.S. Cl. 228—1 11 Claims

1. A vibratory welding apparatus comprising:

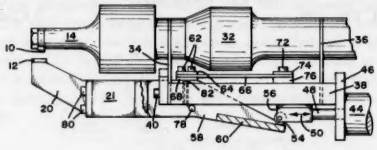
a support;

an electroacoustic converter supported by said support, said converter being constructed to be resonant along its longitudinal axis when energized with electrical energy of predetermined frequency for providing vibrations;

a horn having a workpiece engaging surface coupled to said converter for transmitting vibrations from said converter to a workpiece in contact therewith;

anvil means having a jaw;

mounting means which include a leaf spring mounting said anvil means to said support for limited pivotal motion of said anvil means relative to said support, said leaf spring maintaining said anvil means in substantially play-free alignment relative to said support along said axis and providing a bias force for opposing the pivotal motion of said anvil means relative to said support, and

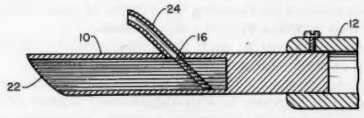


motive means coupled between said support and said anvil means for causing when actuated said anvil means to undergo pivotal motion for moving said jaw toward said workpiece engaging surface and for providing a static clamping force upon a workpiece disposed between said anvil means and said workpiece engaging surface, said clamping force being substantially perpendicular to said axis.

3,917,147
SOLDER TIP CLEANING APPARATUS

Louis Vanyi, 246 Crestwood Ave., Ventura, Calif. 93003

Filed Apr. 2, 1974, Ser. No. 457,284
Int. Cl.² B23K 3/02
U.S. Cl. 228—19 4 Claims



1. In a hand tool useful in performing soldering and desoldering operations, said tool having a removable heatable tip having at least one capillary passage extending away from the working end of the tip toward the interior end of the tip, the improvement which comprises:

a. at least one passageway passing through the outer wall of the tip communicating with the interior end of the at least one capillary passage so that accumulated solder and debris will be purged from said at least one capillary passage and expelled from the passageway by vapor pressure when the heated working end of the solder tip is pressed down on a moistened sponge means;

b. said at least one passageway which passes through the outer wall of the tip terminating in a tube attached to the soldering tip for directing expelled materials into a receptacle.

3,917,148
WELDING TIP

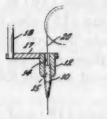
Robert C. Runyon, Del Mar, Calif., assignor to Technical Devices, Inc., San Diego, Calif.

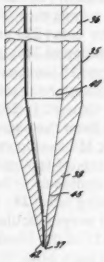
Filed Oct. 19, 1973, Ser. No. 408,044
Int. Cl.² B23K 3/02
U.S. Cl. 228—54 14 Claims

1. A capillary bonding tip for use as a welding tool for electronic components wherein the tip is subjected to heat during use and wherein a metallic member is advanced through the tip comprising:

means forming a body member, said body member terminating in an end face defining the welding surface of said tip,

said body member including surface means defining a bore in axial alignment with the center axis of said body member,





said bore including a portion extending to the end face of said body member having walls tapered at a predetermined angle to a minimum transverse dimension at said end face, and

said bore in the portion of said body member forming said end face being of capillary dimensions.

3,917,149

PROCESS OF PREPARING EMBOSSED SINTERED ARTICLES OF MANUFACTURE

Ernest J. Breton; Jack D. Wolf; Dexter Worden, and John T. Bailey, all of Wilmington, Del., assignors to Mallory Composites, Inc., Indianapolis, Ind.

Filed Sept. 15, 1972, Ser. No. 289,258
Int. Cl.² B23K *31/02*
U.S. Cl. 228—124 **11 Claims**

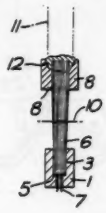
1. A process of preparing an article having an embossed pattern on at least one surface thereof which comprises mixing solid particulate braze alloy material and particulate polytetrafluoroethylene resin to provide a first mixture and mixing solid particulate filler material and particulate polytetrafluoroethylene resin to provide a second mixture, each of the mixtures containing about 1 to about 20 volume percent polytetrafluoroethylene resin, mechanically working each of the mixtures until the polytetrafluoroethylene fibrillates and the resulting fibrils interconnect and entrap solid particulate material to provide non-woven cloths having handleability and flexibility, folding each of the cloths, mechanically working each of the folded clothes along a crosswise axis to the direction of the initial mechanical working step, forming a surface of the cloth containing filler material into a pattern to be replicated, and heating the cloths while contiguous to each other to a temperature sufficient to drive off polytetrafluoroethylene and infiltrate braze alloy into the cloth containing filler material by melting braze alloy to provide an article having an embossed pattern on a surface thereof.

3,917,150

SEALS AND METHOD OF MANUFACTURE THEREOF

John Gilbert Ferguson, and Geoffrey Dallinger Waters, both of Bristol, England, assignors to Rolls-Royce (1971) Limited, London, England

Filed Nov. 15, 1974, Ser. No. 524,379
Claims priority, application United Kingdom, Nov. 23, 1973, 54518/73
Int. Cl.² B23K *31/02*; **F16J** *15/48*
U.S. Cl. 228—159 **6 Claims**



1. A method of manufacturing a seal element comprising the steps of making a brush having a plurality of tightly packed bristles secured to and projecting from a surface of a backing member, clamping the free ends of the bristles between a pair of clamping members, integrally joining the clamping members and the tips of the bristles, and subsequently removing the backing member and the ends of the bristles attached thereto.

3,917,151

VACUUM BRAZING PROCESS

Ivan B. Robinson, Livermore, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Division of Ser. No. 330,709, Feb. 8, 1973. This application Dec. 26, 1974, Ser. No. 536,494
Int. Cl.² B23K *1/04*
U.S. Cl. 228—220 **6 Claims**

2. A process for vacuum brazing aluminum parts comprising:

a. assembling an aluminum part to be joined in the desired relationship and in contact with an aluminum brazing sheet having a brazing alloy cladding;

b. placing said assembled members in a chamber capable of sustaining a vacuum and in close proximity to said assembled members a magnesium source comprising a metal base containing at least 0.8 percent by weight magnesium, said metal base selected from the group consisting of aluminum alloys and magnesium or magnesium alloys, and having bonded to the surface of said metal base a magnesium-free aluminum alloy having a melting point of at least 50°F. higher than said metal base;

c. subjecting the assembled members and said magnesium source to a pressure less than 10^{-2} Torr of mercury (absolute);

d. heating the assembled members and said magnesium source to brazing temperature so as to melt said brazing alloy on the brazing sheet and to cause said metal base to dissolve the magnesium-free cladding on the surface thereof and thereby allow the magnesium in said metal base to vaporize;

e. maintaining said brazing temperature until said brazing alloy has flowed into contact with said aluminum part in

contact with the brazing sheet so as to form a fillet therewith; and

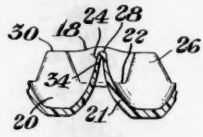
f. cooling the assembly to solidify the brazing alloy.

3,917,152

EGG CARTON

Francis L. Burkett, Breckenridge, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 7, 1972, Ser. No. 224,118
Int. Cl.² B65D 1/24, 1/36
U.S. Cl. 229—2.5 EC 8 Claims



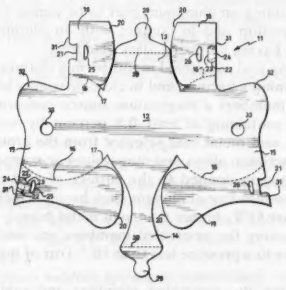
1. In combination with a packaging structure designed to package eggs and the like, wherein the improvement comprises: a body section including a plurality of downwardly directed deep egg receiving pockets or cells, all adjacent cells or pockets separated by at least one flexible thin walled separator preventing substantial contact and providing resilience and flexibility between said eggs and the like to be positioned in said adjacent cells or pockets, said separators formed by upwardly directed extension walls from cell or pocket walls of said adjacent cells or pockets, said extension walls terminating in upper end walls, said cells or pockets having relatively thick cross-sections to provide structural strength in said structure and said separators having relatively thin cross-sections to prevent substantial contact and provide resilience and flexibility between said eggs and the like to be positioned in said adjacent cells or pockets.

3,917,153

UNITARY FOLDABLE LAMINAR BLANK FOR THE MANUFACTURE OF CONTAINERS USEFUL AS TOY FOOTBALL HELMETS

Felipe Holschneider, Monte Altai 413, Mexico 10, D. F., Mexico

Filed May 28, 1974, Ser. No. 473,473
Claims priority, application Mexico, Mar. 1, 1974, 149614
Int. Cl.² B65D 3/00, 5/00
U.S. Cl. 229—8 2 Claims



1. A unitary laminar blank of flexible material adapted to be manipulated to form an open container for holding consumer goods such as food and which can also be used as a toy football helmet, having the following combination of features:

a. the periphery of the blank is cut to provide a cruciform arrangement, comprising a central portion (12) having two opposite tapered extensions (13,14) and two opposite lateral portions (15);

b. said tapered extensions (13,14) each have a coupling tab (29) projecting therefrom and each is foldable about a fold line (30) perpendicular to the axis of the extension;

c. each lateral portion (15) has a side extension (18) at one side thereof adjacent a side edge of one tapered extension (13), said side extension (18) being foldable about curved fold lines (16) at the bases thereof;

d. each lateral portion (15) also has a side extension (19) at the opposite side thereof adjacent a side edge of the other tapered extension (14), said side extension (19) being foldable about curved fold lines (16) at the bases thereof;

e. one of the extensions (18) and one of the side extensions (19) has an indentation (21) at the outer edge thereof;

f. the other side extension (18) and the other side extension (19) each has a connecting tab (24) at the outer edge thereof, formed by cuts (22) and corresponding in location to the indentations (21); and

g. each side extension (18) and each side extension (19) has a slot (25, 26) adjacent a corresponding indentation (21) or tab (24), the slots (25, 26) in side extensions (18) being equidistant from the axis of tapered extension (13) and the slots (25, 26) in side extensions (19) being equidistant from the axis of tapered extension (14);

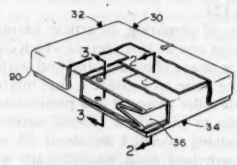
whereby, to form the container or helmet, the side extensions (18, 19) and the coupling tabs (29) are folded along their fold lines into substantially perpendicular position with respect to the central portion (12) of the blank, the two lateral portions (15) are bent towards each other to form a rounded configuration at the bends and to effect overlapping of folded side extensions (18) and overlapping of folded side extensions (19), the indentations (21) and connecting tabs (24) in the side extensions (18, 19) are respectively latched together causing registration of the respective slots (25, 26), the two tapered extensions (13, 14) are bent toward each other to form a rounded configuration at the bends, and the two coupling tabs (29) are then inserted into the corresponding registered slots (25, 26) to maintain the bent and folded portions of the blank in position with the central portion (12) forming the bottom of the container or the top of the helmet.

3,917,154

CONTAINER SUITED FOR AN EXPANDED VOLUME OR REDUCED VOLUME CONFIGURATION

Douglas J. A. Dove, Edmonds, Wash., assignor to Interstore Transfer Specialists, Inc., Seattle, Wash.

Filed Apr. 19, 1973, Ser. No. 352,516
Int. Cl.² B65D 5/35, 13/00
U.S. Cl. 229—23 R 34 Claims



1. A container assembly reusable for many shipments and transfers, arrangeable in an expanded volume configuration and in a reduced volume configuration, comprising:

a. a cover subassembly having: a planar top surface structure and depending flaps forming a lid; and reinforcing antitear means for said depending flaps, thereby making said cover subassembly more resistant to rough handling; and

b. a bottom subassembly; having: a planar bottom surface structure; upstanding side surface structures whose lower

edges join the outer edges of the bottom surface structure; straight line scores, running the full length of each side surface structure, parallel to the bottom surface structure, dividing each side surface structure into an upper part, or volume changing flap, and a lower part, or fixed side structure said fixed side structures being joined together along their lateral edges, and said scores permitting the volume changing flaps to be pivoted with respect to the fixed side structures; an additional volume changing structure collapsible during the reduced volume configuration and expandable during the expanded volume configuration to supplement the strength of the volume changing flaps; and reinforcing antitear means for the volume changing flaps thereby making the said bottom subassembly more resistant to rough handling.

3,917,155
CARTON

Robert P. Bemiss, 925 Vista Road, Hillsborough, Calif. 94010

Continuation-in-part of Ser. Nos. 231,204, March 2, 1972, Pat. No. 3,756,495, Ser. No. 192,720, Oct. 24, 1971, Ser. No. 154,784, June 21, 1971, Pat. No. 3,779,447, and Ser. No. 83,704, Oct. 26, 1970, Pat. No. 3,715,853. This application Oct. 4, 1972, Ser. No. 298,767
Int. Cl.² B65D *5/24*
U.S. Cl. 229—31 R **8 Claims**

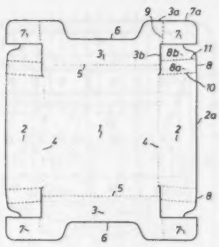
1. A carton corner construction comprising a bottom wall, a pair of side walls disposed normal to each other and to said bottom wall, a flange on each side wall normal thereto, one side wall and its flange having coincident edges, the other side wall and its flange having offset edges whereby a portion of said last-mentioned flange projects beyond the edge of said other side wall, a gusset hinged by first and second fold lines to said one and other side walls respectively, a third fold line dividing said gusset into a pair of gusset panels folded along said third fold line against one another and against one of said side walls, a flange hinged by a fourth fold line to one of said gusset panels, a tab projecting from said flange portion normal thereto and in the same plane thereof, and said tab being in overlapped relationship to said one side wall flange.

3,917,156
STACKABLE PACKING TRAYS

Marcel Baudet, Nantes (Loire-Atlantique), France, assignor to Societe a Responsabilite Limitee EPEX, Nantes, France

Filed Nov. 15, 1973, Ser. No. 416,201
Claims priority, application France, Nov. 15, 1972, 72.40593; Dec. 29, 1972, 72.46966; Oct. 29, 1973, 73.38495
Int. Cl.² B65D *5/26*
U.S. Cl. 229—32 **31 Claims**

1. In a blank of the type when set up forms a stackable tray including a polygonal bottom panel and four side panels each joined thereto by an associated fold line, the improvement comprising means defining at each corner of the bottom panel a polygonal area of material bounded at least in part by a lateral edge of each adjacent side panel for forming a stacking and securing panel internally of the set up tray at each corner thereof, a first side panel at each corner having a height greater than that of a second side panel at each corner, a tab projecting from each first side panel lateral edge and being adapted for securement to the exterior of its adjacent second side panel, the tab of each first side panel having an edge additionally setting-off at least in part said stacking and securing panel, and at least a single fold line in each stacking and securing panel for dividing the same into a stacking panel joined to its associated second side panel at the latters lateral

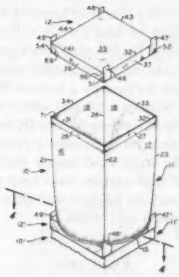


edge and a terminal securing panel joined by said at least a single fold line to its associated stacking panel whereby upon the securement of each terminal securing panel to its associated first side panel the stacking panel thereof spans its associated bottom panel corner spaced inwardly from its apex to form a stacking edge spaced below an uppermost edge of the associated side panel.

3,917,157
STACKABLE CONTAINER AND COVER

Ernest L. Smith, Kansas City, Mo., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 7, 1974, Ser. No. 440,482
Int. Cl.² B65D *5/64, 43/00*
U.S. Cl. 229—43 R **13 Claims**

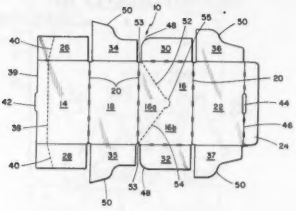


1. A container comprising a generally tubular body member having a circular end with a generally circular cross section and a rectangular end with a generally rectangular cross section, circular closure means at said circular end, and rectangular closure means at said rectangular end, said rectangular closure means having an uninterrupted closure surface to provide uninterrupted coverage of the opening in said rectangular end of said container, said rectangular closure means also having a stacking tab located adjacent each of the four corners thereof with each said stacking tab projecting beyond said uninterrupted closure surface away from said circular end of said container, said circular end of said container and said rectangular closure means being sized to permit all four corners of said rectangular closure means to extend beyond the circumference of the contiguous circular end of an identical container positioned thereagainst.

3,917,158
DISPLAY PACKAGE

Gus Dorofachuk, Willingboro, N.J., and Paul Gosselin, Baltimore, Md., assignors to Stone Container Corporation, Chicago, Ill.

Filed Mar. 27, 1974, Ser. No. 455,147
Int. Cl.² B65D *17/24, 71/00, 5/54*
U.S. Cl. 229—51 TS **8 Claims**



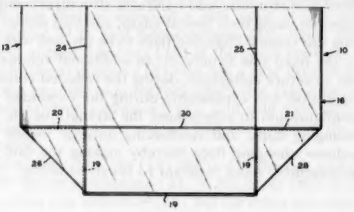
1. A carton formed from a one-piece paperboard blank, said carton having four side panels defining top, bottom, front and back walls of said carton and having opposite end walls defined by overlapping secured flaps, each of said flaps forming part of the end wall being hingedly connected to one of said wall forming panels, a front bottom flap hingedly connected to said bottom wall forming panel and overlapping and being secured to a minor portion of said front wall forming panel, said front wall having a line of weakened strength extending generally parallel to said bottom wall at a short distance from said bottom wall, the area between said line and said bottom wall defining said minor portion of said front wall to which said front bottom flap is secured, said line of weakened strength extending into and across said front flaps connected to said front wall, the area of each said front flap between said weakened line extensions and said bottom wall defining said front flap portions, said bottom wall, said minor portion of said front wall adjacent said bottom wall which has said front flap secured thereto, a major portion of said back wall and portions of certain of said end wall forming flaps being separable from the remainder of said carton to form a display tray, said end wall forming flaps being configured and secured together so as to enable such separation and to provide a tray having end walls each defined by a bottom flap which extends upwardly from said bottom wall and which has a rear section secured to a back flap extending forwardly from said back wall and a front section secured to at least a portion of a front flap extending rearwardly from said minor portion of said front wall at each end of said carton, said rear section extending further upwardly from said bottom wall than said front section to thereby form stepped end walls.

3,917,159
REVERSE FOLD SELF-OPENING PLASTIC SQUARE BOTTOM BAG

Gerald M. Platz, Champaign, and James B. Honn, Arcola, both of Ill., assignors to National Distillers and Chemical Corporation, New York, N.Y.

Division of Ser. No. 243,946, April 14, 1972, Pat. No. 3,799,042. This application Nov. 7, 1973, Ser. No. 413,467
Int. Cl.² B65D *33/00*
U.S. Cl. 229—58 **3 Claims**

1. A flat-bottom bag produced from thermoplastic material including front and rear walls united along each longitudinal edge by a gusset, said bag having been heated sealed transversely and severed adjacent one extremity to provide a bag having a closed bottom and an open mouth, each bottom corner of said bag including an upwardly directed double-walled triangular portion folded along a vertical median line thereof, said median line being in a plane substantially identical to the plane of the inner edge of the associated gusset, the median line of each folded double-walled triangular portion being constituted by an included extremity of the transverse bottom seal and said bag having inwardly tapered corner portions defined by the overlying edges of said folded double-

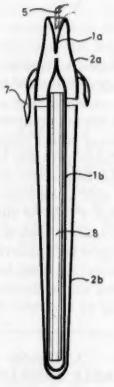


walled triangular portions, and fold lines extending across the front and rear walls to provide the longitudinal edges of the flat bottom of said bag, the spacing of each of said transverse fold lines from the bag sealed bottom edge being substantially identical to the depths of said gussets.

3,917,160
DEVICE FOR THE STERILE ENCLOSURE OF NON-STERILIZABLE OBJECTS

Sven Emanuel Olerud, Lannaholm, Sweden, assignor to Medical Products Octagon AB, Uppsala, Sweden

Filed Nov. 26, 1973, Ser. No. 419,026
Claims priority, application U.S.S.R., Jan. 18, 1973, 73006678
Int. Cl.² B65D *33/16, 33/00*
U.S. Cl. 229—62 **4 Claims**



1. A flexible enclosure device for enclosing articles in a sterile manner comprising:

a. two end sections of generally tubular configuration that are each closed at one end and open at the other end, one of said end sections being annularly disposed around the other end section,

b. a tubular intermediate section having two open ends,

c. a first connecting means for detachably connecting one open end of the tubular intermediate section to the open end of one end section in a gas tight manner,

d. a second connecting means for detachably connecting the other open end of the tubular intermediate section to the open end of the other end section in a gas tight manner,

e. adhesive material disposed adjacent the interior of the open end of the inner of said two annularly disposed end sections, and

f. a removable protective strip covering said adhesive material.

3,917,161
AIR INLET MEANS FOR AIR CONDITIONING INSTALLATIONS OR THE LIKE

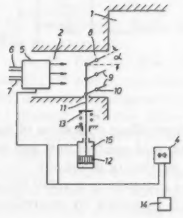
Peter Wilhelm Nielsen, Nordborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Continuation of Ser. No. 369,927, June 14, 1973, abandoned. This application Apr. 15, 1974, Ser. No. 460,922

Claims priority, application Germany, May 5, 1972, 2222049

Int. Cl.² F24F *11/02*

U.S. Cl. 236—13 **3 Claims**



1. An air conditioning system comprising an enclosed room having wall means with an air inlet opening therein and duct means on the upstream side of said air inlet opening, thermal means in said duct means for raising and lowering the temperature of air flowing through said opening, movable vane means for controlling the angular direction of air flow through said opening, thermostatic means in said room, first operating means responsive to said thermostatic means for modulatingly varying the inclination of said vane means downwardly as the temperature of said room decreases, and second operating means responsive to said thermostatic means for actuating said thermal means to selectively raise and lower the tmeperature of air flowing in said duct means.

3,917,162
DIAPHRAGM VALVE FOR CONTROLLING SUPPLY OF GAS TO WATER HEATER

Albin Trotter, and Ursus Trotter, both of Calle Ezequias Allien de 2458, Santiago, Chile

Filed Nov. 22, 1974, Ser. No. 526,211

Int. Cl.² F22B *35/00*

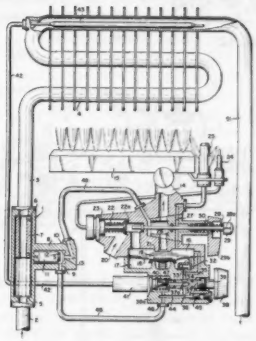
U.S. Cl. 236—23 **8 Claims**

1. In a diaphragm valve for controlling the flow of gas to a water heater including a burner and equipped with a magnetic member responsive to variations in the flow of water to said heater, said valve comprising first and second chambers separated by a diaphragm, said first chamber being provided with a gas inlet and an outlet leading to said burner, and said diaphragm being movable between a first position closing said outlet and a second position in which said outlet is left open in dependence on the relative pressure in said chambers, the improvement which comprises

duct means connecting said first and second chambers, and providing an exhaust for said second chamber,

magnetically actuated valve means responsive to the position of said magnetic member and positioned to control the exhaust of gas from said second chamber through said duct means, and

manually adjustable heat responsive valve means responsive to the temperature in said heater for additionally controlling the exhaust of gas from said second chamber through said duct means.



3,917,163
WATERLINE THERMOSTAT AND ASSEMBLY

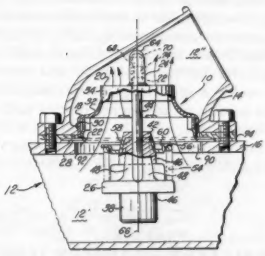
Frank E. Obermaier, Lombard, and Arthur A. Scott, Mount Prospect, both of Ill., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jan. 4, 1973, Ser. No. 321,101

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² F01P *7/16*

U.S. Cl. 236—34 **6 Claims**

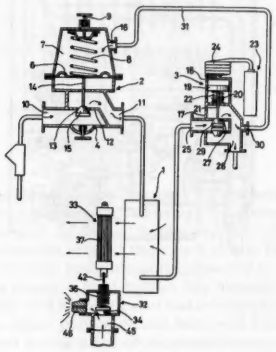


6. A thermostat assembly as defined in claim 5 wherein said elliptical opening has a minor axis of distance greater than said diameter of said sleeve portion but less than the diametrical distance of said sleeve portion between said protrusion whereby said thermostat is locked in predetermined position in said outlet casting.

3,917,164
AUTOMATIC TEMPERATURE AND HUMIDITY REGULATING APPARATUS

Hisashi Motoyama, No. 3-5, Ebara 7-Chome, Shinagawa-Ku, Tokyo, Japan

Division of Ser. No. 341,573, March 15, 1973, Pat. No. 3,877,637
This application July 2, 1974, Ser. No. 485,282
Claims priority, application Japan, Apr. 1, 1972, 47-32742; Apr. 1, 1972, 47-32743
Int. Cl.[2] F24H *3/06;* **F24F** *11/00*
U.S. Cl. 236—42 **5 Claims**



1. Control apparatus adapted to be used for compensating temperature in a heat exchanger having an inlet and an outlet, said apparatus comprising a differential pressure regulating valve located in said inlet side of said heater exchanger and controlling flow thereto, said differential pressure regulating valve having an upper part and a lower part, a flexible means in said upper part dividing the latter into an upper section and a lower section, a spring in said upper section biasing said flexible means in a direction to open the differential pressure regulating valve, a valve stem connected to said flexible means, said valve stem extending from said lower section into said lower part, a valve element on said valve stem disposed in said lower part, a temperature compensating valve located in said outlet side of said heat exchanger sensing ambient temperature and controlling outlet flow therefrom, said temperature compensating valve having a temperature sensing sleeve having fluid therein, piston means on said temperature compensating valve operable to move up and down and control said temperature compensating valve according to the expansion of said fluid in said sensing sleeve, said temperature compensating valve having an outlet, and conduit means between said outlet of said temperature compensating valve and said upper section of said upper part of said differential pressure regulating valve, whereby said conduit transmits the outlet pressure of said temperature compensating valve to said differential pressure regulating valve to effect control of the latter.

3,917,165
TIMER CONTROLLED HIGH AND LOW TEMPERATURE THERMOSTAT

Walter A. Cross, R.D. 1, Box 203-3 Rte. 88, Bristolville, Ohio 44402

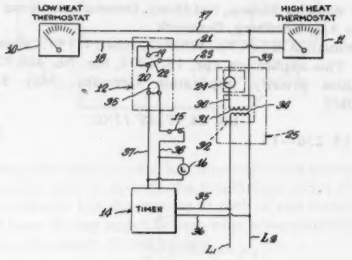
Filed Feb. 19, 1974, Ser. No. 443,811
Int. Cl.[2] F23N *5/20;* **H01H** *37/12*
U.S. Cl. 236—46 **7 Claims**

1. A control device for supply of energy to a heating unit which is adapted to heat a space, comprising:

a low heat thermostat responsive to a lower range of temperatures within said space, and a high heat thermostat responsive to a higher range of temperatures within said space,

a control unit for controlling flow of heat-producing energy from a source to said heating unit,

switch means for selectively placing said control unit under the influence of said low heat thermostat or said high heat thermostat,



timer means for controlling operation of said switch means, said thermostats, said control unit and said switch means being wired in an electrical circuit,

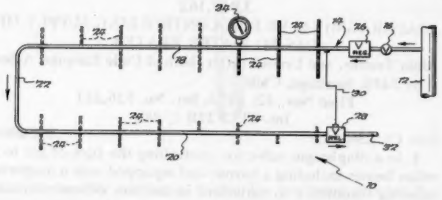
said switch means comprising a relay having a coil and an electrical switch operated by energization of said coil, and

a manually operable electric switch in said electrical circuit between said timer means and said relay, whereby manual operation of such switch interrupts flow of current to said relay without stopping operation of said timer means.

3,917,166
DRIP IRRIGATION METHOD

Robert W. Hildebrandt, Northridge, and Howard Hanks, Jr., Walnut Creek, both of Calif., assignors to Andco Incorporated, Buffalo, N.Y.

Division of Ser. No. 479,610, June 17, 1974. This application Dec. 11, 1974, Ser. No. 531,736
Int. Cl.[2] B05B *1/16, 1/20, 12/00*
U.S. Cl. 239—1 **4 Claims**



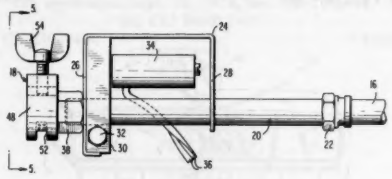
1. A method of installing a drip irrigation system comprising: connecting a feeder tube to an irrigation fluid supply line and placing said tube along a path traversing a plurality of areas to be irrigated; providing a plurality of emitters operable to deliver fluid at a predetermined rate at various pressures, respectively; supplying a preselected total flow rate of fluid at a predetermined level of pressure to said tube; forming an opening in said tube at a predetermined location; measuring the pressure at said opening; selecting an emitter adapted to deliver said predetermined rate at said measured pressure; and installing said selected emitter at that location.

3,917,167

LIQUID ATOMIZING METHOD AND APPARATUS

Larry N. Pearce, Oak Park; C. Lyle Lacy, Galena, and Arthur E. Neumann, Winnetka, all of Ill., assignors to Cotton Incorporated, New York, N.Y.

Filed Aug. 8, 1974, Ser. No. 495,925
Int. Cl.² B05B 17/06
U.S. Cl. 239—4 15 Claims



1. A method for atomizing a liquid into uniformly sized droplets comprising the steps of:

fitting a thin, normally flat, flexible orifice ribbon means, having a plurality of apertures fashioned therethrough, across a radial aperture fashioned into a conduit adjacent a closed end thereof with the other end of the conduit being in communication with a source of liquid; fitting a ring having a diameter greater than the diameter of the conduit around the closed end of the conduit;

operably aligning a radial port fashioned through the ring with the radial aperture extending into the conduit;

releasably securing the ring to the conduit wherein the central longitudinal axis of the ring is offset with respect to the central longitudinal axis of the conduit such that edge portions of the orifice ribbon are secured between the exterior surface of the conduit and the interior surface of the ring;

pressurizing the liquid within the conduit for issuing streams of liquid through the apertures within the flexible orifice ribbon; and

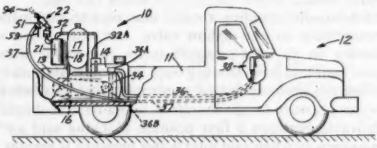
vibrating the exterior surface of the conduit to impart vibrations to the streams of fluid exiting from the flexible orifice ribbon to break the streams into uniform sized droplets downstream with respect to the flexible orifice ribbon.

3,917,168

DISPENSING APPARATUS AND METHOD

William L. Tenney, Crystal Bay, Minn. 55323

Filed Apr. 25, 1974, Ser. No. 464,146
Int. Cl.² B05B 1/24; A01N 17/08
U.S. Cl. 239—13 32 Claims



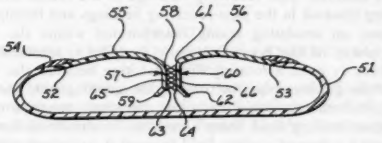
26. A method of dispensing a liquid material into the atmosphere with a nozzle comprising: compressing and heating air with pump means, supplying the air compressed and heated by the pump means to the nozzle at a temperature of at least 250° F. to heat the nozzle, supplying liquid material to the nozzle without substantially heating the liquid material, heating said liquid material in the nozzle by transferring heat energy from the heated air to the liquid material, and simultaneously directing the heated air and heated liquid material from the nozzle into the atmosphere whereby high velocity heated air atomizes the heated liquid material into relatively small droplets.

3,917,169

EMITTER FOR IRRIGATION SYSTEMS

Richard C. Harmony, Tucson, Ariz., assignor to Harmony Emitter Company, Inc., Tucson, Ariz.

Continuation-in-part of Ser. No. 456,617, April 1, 1974. This application Dec. 16, 1974, Ser. No. 532,869
Int. Cl.² B05B 01/20
U.S. Cl. 239—107 11 Claims



1. In an irrigation system having an apertured water pipe for conveying a flow of water from a source of water under pressure to each aperture, an emitter disposed at each aperture for discharging water from the water pipe to the area to be irrigated, said emitter comprising in combination:

a. a water passageway for discharging water from an aperture in the water pipe to the soil to be irrigated;

b. a pair of elements for supporting said water passageway within the aperture of the water pipe, one of said pair of elements extending across one part of the aperture and another of said pair of elements extending across another part of the aperture, said one and said other of said pair of elements including an edge, which edges, in combination, define the discharge orifice of said water passageway;

c. bias means for constricting said water passageway in response to variations in water pressure within the water pipe; and

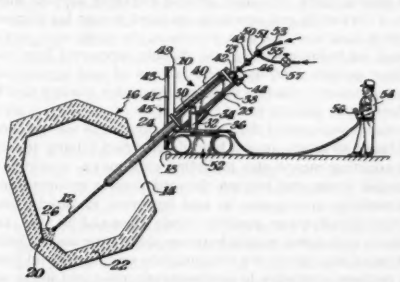
d. means for establishing a pressure gradient within said water passageway as a function of the water pressure within the water pipe; whereby, the rate of water discharge through said emitter is maintained at a constant rate despite variations in water pressure within the water pipe.

3,917,170

MOBILE REFRACTORY GUNNING APPARATUS

Joseph J. Marino, Ridgefield, Conn., assignor to Quigley Company, Inc., New York, N.Y.

Filed July 19, 1974, Ser. No. 490,009
Int. Cl.² B05B 3/12, 9/06; B05C 5/00
U.S. Cl. 239—132.3 17 Claims



1. A mobile refractory gunning apparatus comprising a motorized carriage capable of movement over a substantially

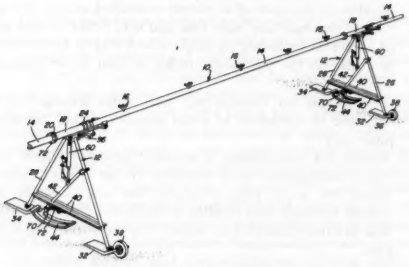
horizontal surface, a turntable, rotatable bearing means having a substantially vertical axis of rotation mounting the turntable on the carriage, an inclinable support barrel, a bracket on the turntable mounting the barrel to rock up and down on the turntable, the barrel having spaced longitudinal motion-permitting bearings, a tubular boom being mounted in the spaced longitudinal motion-permitting bearings in the barrel, longitudinal extension means reacting between the barrel and the boom whereby the longitudinal extension of the boom in front of the carriage is varied, a vertically-acting extension means reacting between the turntable and the barrel whereby the angle of inclination of the boom is varied, an elongated gunning pipe for carrying and directing a flow of fluid refractory material, pipe receiving bearings in the boom, the pipe being inserted in the pipe-receiving bearings and through the boom, an insulating casing incorporated within the outer periphery of the boom, whereby the pipe is shielded from refractory heat, a rotating drive reacting between the boom and the gunning pipe for rotating the gunning pipe about its longitudinal axis within the boom, and supply means for pressurized cooling fluid being connected to the boom for conducting a flow of cooling fluid through it and about the gunning pipe.

3,917,171

PROPELLING PIPE SUPPORT TOWER FOR PIVOT IRRIGATION SYSTEMS

Elmer E. Reinke, Rural Rte., Davenport, Nebr. 68335

Filed Jan. 30, 1975, Ser. No. 545,716
Int. Cl.[2] B05B *3/02*; **B62M** *27/02, 29/02*
U.S. Cl. 239—177 **11 Claims**



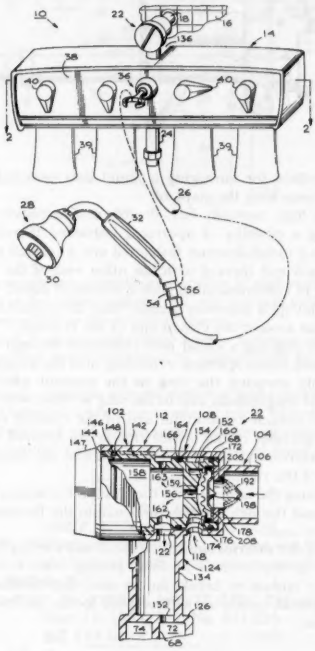
1. An irrigation pipe supporting and propelling tower including an upstanding frame including upstanding front and rear members interconnected at their lower end portions by means of a front to rear brace structure extending and secured therebetween, said front member including a forwardly and downwardly inclined portion intermediate its upper and lower ends, the lower portion of said lower end including front and rear spaced large plan area ground engaging support members, a forwardly and upwardly inclined power leg disposed between said front and rear members, the upper end portion of said leg being pivotally and slidably supported from said inclined portion, the lower end portion of said leg and said brace structure including coacting means for guiding said leg for lengthwise shifting of the latter relative to said guide structure and movement of the lower end portion of said leg along said brace structure against lateral deflection relative thereto, said coacting means also including cam means operative to cam said lower end portion forward from a predetermined rear position in response to said leg being elevated from a predetermined lower position while disposed in said rear position, and motor means between said frame and a central portion of said power leg intermediate said upper and lower end portions operative to intermittently raise and lower said central portion, the lower terminal end of said leg including a large plan area ground engaging foot displaceable downwardly below and upwardly above a horizontal plane containing said support members upon actuation of said motor means to lower and raise, respectively, the central portion of said leg.

3,917,172

FLUID MIXING AND DISPENSING APPARATUS

Harry M. O'Hare, Anaheim, Calif., assignor to Federal Investment Corporation, Kansas City, Mo.

Filed June 5, 1974, Ser. No. 476,670
Int. Cl.[2] B67D *5/34*; **B05B** *15/06*; **F16K** *17/00*
U.S. Cl. 239—305 **6 Claims**



1. Apparatus for mixing and dispensing a selected conditioning agent in a shower bath spray comprising:

a housing;

a manifold positioned in said housing and having an inlet and an outlet;

outlet means for coupling said manifold outlet to a shower spray head;

inlet means for coupling a water inlet pipe to said manifold comprising an anti-siphon valve, said anti-siphon valve having an air inlet passageway for preventing water in said manifold from flowing back into said water inlet pipe when the pressure in said water inlet pipe falls below the water pressure in said manifold, and a flexible diaphragm movable between a first position blocking said air inlet passageway when said inlet water pressure is greater than said manifold pressure and a second position enabling air to flow toward said inlet pipe and prevent reverse flow of water from said manifold when said manifold water pressure exceeds said water inlet pressure, said anti-siphon valve further including a deflector having a closed central conical portion and at least one radially-spaced opening, said diaphragm having a central opening adjacent said deflector central conical portion, said deflector opening and said diaphragm central opening defining a water flow path directing the diaphragm to said first position when

the water inlet pressure exceeds the manifold water pressure.

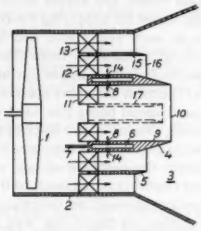
3,917,173
ATOMIZING APPARATUS FOR FINELY DISTRIBUTING A LIQUID IN AN AIR STREAM

Ritindar Singh, Finspong, Sweden, assignor to Stal-Lavel Turbin AB, Finspang, Sweden

Continuation of Ser. No. 352,542, April 19, 1973, abandoned. This application Sept. 26, 1974, Ser. No. 509,492

Int. Cl.² B05B *7/00*

U.S. Cl. 239—400 **7 Claims**



1. Atomizing apparatus for finely distributing a liquid into an air stream, comprising:

a. at least one primary, cylindrical tubular structure defining an open ended passage and having its inner and outer surfaces exposed to the air stream, said tubular structure having a cylindrical inner surface and an outer surface having an upstream cylindrical part and a downstream conical part forming together with said inner surface a sharp downstream edge, said tubular structure embodying a hollow chamber between said inner and outer surfaces with perforations in the walls of said chamber, said perforations leading to the inner surface of the tubular structure, and serving to conduct liquid from said chamber onto said inner surface, and distributing said liquid onto said inner surface;

b. and means for propelling an air stream through said passage and along said tubular structure, to pick up and entrain minute liquid droplets at the downstream edge of said surface.

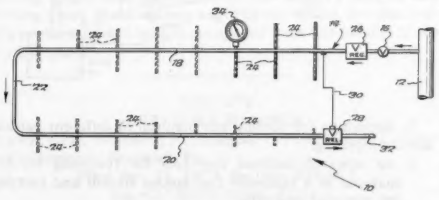
3,917,174
DRIP IRRIGATION SYSTEM

Robert W. Hildebrandt, Northridge, and Howard Hanks, Jr., Walnut Creek, both of Calif., assignors to Andco Incorporated, Buffalo, N.Y.

Filed June 17, 1974, Ser. No. 479,610

Int. Cl.² B05B *1/20, 1/30;* **A01G** *25/02*

U.S. Cl. 239—542 **4 Claims**



1. An irrigation system comprising: a main supply line for conveying fluid under pressure; a feeder tube having a head end connected to said main supply line; control means connected to said feeder tube adjacent said head end for controlling the flow rate of fluid through said feeder tube; means maintaining the fluid at a predetermined presssure at said head end whereby a decreasing pressure gradient exists from said head end of said feeder tube towards the downstream end thereof during flow of fluid therethrough; and a plurality of emitters of varying flow capacities connected to said feeder tube downstream of said flow rate control means, and emitters having relatively lower flow capacities being connected to said feeder tube at said head end portion thereof with emitters having progressively relatively higher flow capacities being connected to said feeder tube at respective locations progressively closer to the downstream end of said feeder tube so that substantially equal amounts of fluid are delivered to a plurality of plant root areas.

3,917,175
CRUSHING APPARATUS HAVING CENTRIFUGAL CLASSIFIER

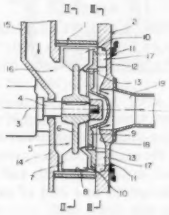
Hiroyuki Maeda, Nishinomiya, and Teruaki Suzuki, Kadoma, both of Japan, assignors to Osaka Gas Company, Ltd. & Kabushiki Kaisha Hosokawa Funtai Kogaku Kenkyusho, Osaka, Japan

Filed Sept. 16, 1974, Ser. No. 506,532

Claims priority, application Japan, Sept. 18, 1973, 48-105340

Int. Cl.² B02C *13/08, 13/13*

U.S. Cl. 241—52 **9 Claims**



1. A crushing apparatus having a centrifugal classifier comprising:

a first housing and a second housing substantially coaxial with each other,

first conduit means and second conduit means for communicating the first housing and the second housing, the first conduit means being connected to both the housings at a position proximate to the peripheral walls thereof and having an annular cross section, the second conduit means being connected to both the housings at a position closer to the axis of the housings than the first conduit means,

hammer means disposed within the first housing and rotatable about its axis,

a chute connected to the first housing at a position closer to the axis than the first conduit means, and

discharge means connected to the second housing at a position closer to the axis than the second conduit means, the first conduit means permitting a whirling gas stream produced in the first housing by the rotation of the hammer means to flow into the second housing and circulate about its axis therein, the second conduit means permitting a portion of the circulating gas to flow into the first housing, the discharge means serving to let the remainder of the circulating gas out of the second housing, whereby a material fed to the interior of the first housing is crushed by the hammer means and is then sent by the gas through the first conduit means into the second housing to circulate about its axis therein, the circulating material is classified into coarse fragments and fine fragments by the cooperative action of centrifugal force and conveying force of the gas stream, the fine fragments are sent to the discharge means by the gas stream and the coarse frag-

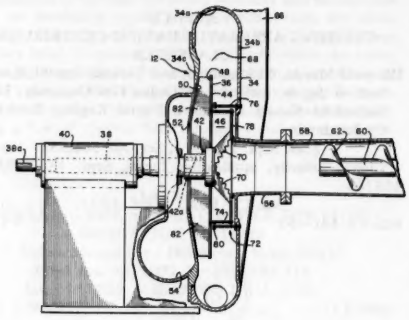
ments are sent through the second conduit means into the first housing by the gas stream.

3,917,176

DISINTEGRATING-AND-BLOWING APPARATUS FOR MATERIAL SUCH AS PULP

Lawrence A. Carlsmith, Amherst, N.H., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Apr. 10, 1974, Ser. No. 459,480
The portion of the term of this patent subsequent to June 14, 1991, has been disclaimed.
Int. Cl.[2] B02C *23/28*
U.S. Cl. 241—55 **2 Claims**



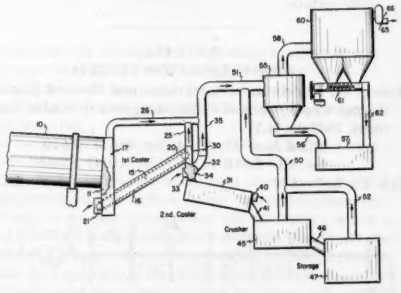
1. In combination, gaseous reaction apparatus and apparatus for disintegrating-and-blowing material such as pulp, said disintegrating and blowing apparatus comprising a housing, a rotatable drive shaft associated with said housing, a rotor in said housing connected to one end of said drive shaft to be rotatably driven by said drive shaft, said housing containing a material chamber on one side of said rotor open to said one side of said rotor and a blowing gas chamber on the opposite side of said rotor open to said opposite side thereof, there being passage means peripherally around said rotor communicating said chambers, said housing having a material inlet connected to said material chamber coaxially of said rotor for supplying material to said material chamber and also a blowing gas inlet communicating with said blowing gas chamber for supplying blowing gas thereto, said housing having a material outlet communicating with said material chamber for discharging gas blown material from such chamber, material shredding means connected to said one end of said drive shaft to be rotatably driven by said drive shaft and adjacent said material inlet for shredding compacted material supplied therethrough, material disintegrating means in said material chamber intermediate said material shredding means and said material outlet for disintegrating the material, said material disintegrating means comprising a plurality of material disintegrating elements carried by said housing, a plurality of fan blades connected to said one end of said drive shaft to be rotatably driven by said drive shaft and on the same side of said rotor as said gas chamber for causing blowing gas supplied to said blowing gas chamber to flow through said passage means peripherally around said rotor and blow disintegrated material through said material outlet, and plug feed means operatively associated with said material inlet for causing material to be supplied to said material chamber through said material inlet in compacted plug form preventing both gas loss from said housing through said material inlet and flow of undesirable gas into said housing through said material inlet, said plug feed means comprising a material supply conduit for connecting said material inlet to a source of the material, said material supply conduit including at least a portion narrowing in cross-section towards said material inlet, a rotatable second drive shaft in said tapering portion of said material supply conduit spaced end-to-end from said first mentioned drive shaft and rotatable separately therefrom, and a feed-and-compacting screw carried by said second drive shaft in said tapering portion of said material supply conduit to be rotatably driven thereby for feeding material into said material inlet while simultaneously compacting material in said tapering portion to thereby form a plug of compacted material in said tapering portion preventing gas flow into-and-out of said material chamber through said material supply conduit, and said gaseous reaction apparatus comprising an elongated, generally vertical vessel, supply conduit means communicating with said material outlet of said disintegrating-and-blowing apparatus to receive material therefrom and connected to the upper end of said vessel for supplying the material to said upper end of said vessel, gas supply means connected to the upper end of said vessel for supplying a mixture of reactant gas and carrier gas to such upper end and to material therein, means for discharging material from the lower end of said vessel, said vessel including an upper portion and a therebelow adjoining, lower portion of cross-section greater than said upper portion, said vessel being provided with a gas receiving chamber extending around said vessel upper portion with its lower end substantially spaced intermediate the ends of said vessel and adjacent the juncture of said vessel portions, said lower end of said chamber being open to the upper end of said vessel lower portion through an unrestricted opening to upwardly receive carrier gas therefrom, wall means intermediate said gas receiving chamber and said vessel upper portion closing said gas receiving chamber from direct connection to said vessel upper portion, gas outlet means for discharging carrier gas from said gas receiving chamber, said gas receiving chamber and said outlet means being free from screens and similar filtering media, and blowing gas supply conduit means communicating with said vessel to receive blowing gas therefrom and connected to said blowing gas inlet for supplying the blowing gas thereto.

3,917,177

METHOD AND APPARATUS FOR COOLING HOT MATERIALS

Harry E. Hoon, Jr., Strongsville, Ohio, assignor to Envirotech Corporation, Menlo Park, Calif.

Filed Jan. 17, 1973, Ser. No. 324,551
Int. Cl. B02c *21/00*
U.S. Cl. 241—57 **2 Claims**



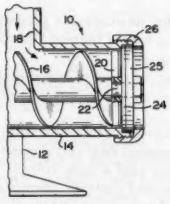
1. Apparatus for cooling hot material of different particle sizes comprising:

a. an upwardly-inclined conveyor for receiving the hot material in a relatively continuous stream and carrying the material upwardly;

b. a first housing surrounding said upwardly-inclined conveyor to form a conduit through which a gas stream passes from the lower end of said upwardly-inclined conveyor to the upper end to contact and partially cool the hot material on the conveyor;

c. means arranged at the upper end of said upwardly-inclined conveyor for separating the partially cooled material into coarse and fine fractions;
d. a downwardly inclined conveyor for receiving the coarse fraction;
e. a second housing surrounding said downwardly-inclined conveyor to form a conduit through which a gas stream passes countercurrently to contact and partially cool the coarse fraction on the conveyor;
f. means for receiving and crushing the coarse fraction from said downwardly-sloping conveyor;
g. means for combining the gas streams exiting from the first and second housing with the fine fraction;
h. a cyclone separator connected to receive said combined gas and fine fraction to cool and to partially separate the fine fraction from the gas stream;
i. means for introducing the gas stream from the cyclone separator into a bag-type separator to further cool and separate the fine particle fraction from the gas stream; and
j. means for maintaining a flowing gas stream through the system.

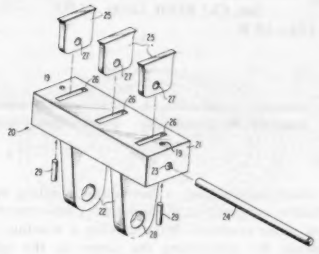
3,917,178
MEAT CUTTER SLICER AND EXTRUDER
James H. Barnes, 283 Tolbert St., Wadsworth, Ohio 44281
Filed Sept. 12, 1973, Ser. No. 396,448
Int. Cl.² B02C *18/36*
U.S. Cl. 241—82.5 **2 Claims**



1. In a meat cutting and/or grinding device, a frame forming an enclosure in which an extruding or forcing means is provided for moving meat along the axis of such means, the combination therewith of a discharge means carried by said frame at an end of the enclosure and positioned normal to said axis, said discharge means having a plurality of spaced radially extending spokes therein with sharp cutting edges on the leading portions thereof, which cutting edges define a cutting plane and with trailing face portions of said spokes being recessed from said cutting plane, radially spaced reenforcing bars extending between said spokes, and a rotatable cutter means immediately adjacent said discharge means for aiding in cutting the meat into small pieces in cooperation with said cutting edges; said spokes having flat surfaces lying in said cutting plane at the leading edges of the spokes and the trailing portions of said spokes are spaced from but parallel to the cutting plane.

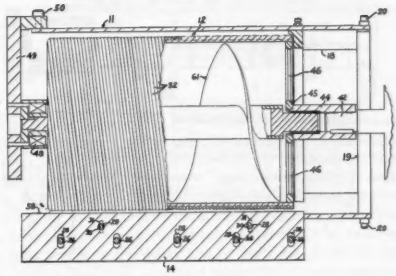
3,917,179
SHREDDER HAMMER
Carl R. Graf, Whitehall, Pa., assignor to Pennsylvania Crusher Corporation, Broomall, Pa.
Filed Jan. 21, 1974, Ser. No. 435,063
Int. Cl.² B02C *13/04, 13/28*
U.S. Cl. 241—194 **12 Claims**

1. A hammer for a crusher and/or shredder of the type including a rotor, said hammer comprising:
a. a relatively large, heavy, broad block for impacting and reducing heavier, harder types of materials fed to said crusher and/or shredder;
b. a plurality of narrow lighter shredder blades carried by said block and projecting therefrom for shredding lighter, softer types of materials; and



c. at least one leg projecting from said block in a direction oppositive to that of said shredder blades said leg including means for pivotal connection to said rotor.

3,917,180
MECHANICAL SEPARATOR MACHINE ROTOR AND METHOD OF MAKING SAME
Stephen A. Paoli, 520 Sixth St., Rockford, Ill. 61108
Division of Ser. No. 297,634, Oct. 16, 1972, Pat. No. 3,857,518. This application July 5, 1974, Ser. No. 486,172
Int. Cl.² B02C *19/22*
U.S. Cl. 241—293 **4 Claims**

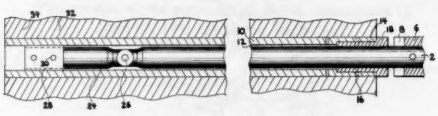


1. In a machine for mechanically separating high grade lean meat in coarse ground form from low grade meat containing sinew, cartilage, and stringy connective tissue, a hollow rotor comprising, in combination:
a. a plurality of circumferentially spaced, axially extending lands;
b. a plurality of helical cutting elements each having a base portion unitary with said lands;
c. said cutting elements being axially spaced on said lands by an amount approximately equal to the width of their base portions;
d. each said base portion having a projecting relieved portion bent generally axially into overlapping relation with the adjacent cutting element and defining therewith an initially constricted passage communicating with the interior of said rotor;
e. said bent relieved portion of said cutting elements all extending in the same direction.

3,917,181
ARRANGEMENT FOR DOFFING PACKAGES WOUND ON A SPINDLE CARRYING A MANDREL

Ronald E. Zajac, Yonkers, N.Y., assignor to Windings, Inc., Goldens Bridge, N.Y.

Filed Sept. 19, 1974, Ser. No. 507,607
Int. Cl.[2] B65H *54/00, 75/02*
U.S. Cl. 242—18 R **2 Claims**

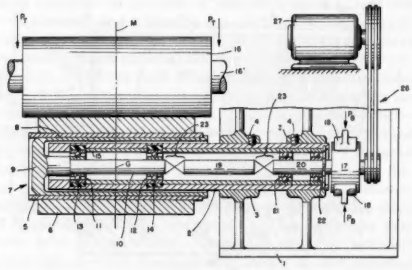


1. In combination with a horizontal winding spindle, a sleeve slidably mounted on the spindle for movement between inner and outer positions for receiving a winding mandrel, clutch means for connecting the sleeve to the spindle for rotation therewith in the inner position of the sleeve, a part pivoted on the free end of the spindle, and cooperating stop means on said part carried by the sleeve and by said part to limit movement of the spindle away from the clutch means to its outer position at a point which permits the sleeve and the part to swing downwardly with respect to the spindle to permit the doffing of a winding carried by the mandrel.

3,917,182
WINDING MACHINE

Erich Lenk, Remscheid, Germany, assignor to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany

Filed Dec. 14, 1973, Ser. No. 424,740
Claims priority, application Germany, Feb. 16, 1972, 7246053[U]; Dec. 16, 1972, 2261709
Int. Cl.[2] B65H *54/02, 54/40*
U.S. Cl. 242—18 R **14 Claims**

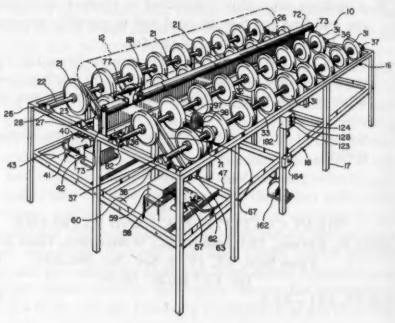


1. In a winding machine for the high speed winding of synthetic threads which comprises:
- a machine frame having a rigid, cantilevered tubular-shaped mounting member defining a substantially horizontal axis of rotation for a winding spool;
- chuck means including a chuck sleeve rotatably mounted concentrically around said mounting member to hold said winding spool;
- anti-friction bearings for supporting said rotatable chuck means on said tubular-shaped mounting member said bearings being resiliently mounted by rubber elements;
- a rotatably driven shaft connected to said chuck means for rotation therewith on said horizontal axis and extending within said tubular-shaped mounting member, the inner end of said shaft being journaled in anti-friction bearings rigidly mounted on the machine frame, and said driven shaft having an elongated torsion-resistant segment interconnected between its inner end and said chuck means by two axially spaced universal-type coupling elements which permit transmission of torque while being flexible to bending moments placed on the driven shaft; and
- means to apply driving or braking torque to said driven shaft in carrying out a thread winding operation.

3,917,183
ROLL-WINDING APPARATUS

Fermer A. Malone, 923 Bow Creek, Duncanville, Tex. 75116

Filed Apr. 18, 1974, Ser. No. 461,998
Int. Cl. B65h *19/20, 17/08*
U.S. Cl. 242—56 R **4 Claims**



1. An apparatus for unwinding a predetermined length of rolled material from a supply thereof and rolling the unwound material, which comprises:
- first and second sets of parallel horizontal supply rollers for rotatably supporting the supply of rolled material therebetween;
- first and second sets of parallel horizontal take-up rollers, parallel to and spaced first and second distances, respectively, away from said supply rollers, for rotatably supporting the unwound material therebetween;
- means spacing said second set of take-up rollers above said first set of take-up rollers;
- an elongated guide roller means, parallel to and interposed between said supply rollers and said take-up rollers and adjacent to said first set of take-up rollers for guiding the unwound material onto said take-up rollers;
- means supporting said guide roller means a sufficient distance above said supply rollers and said take-up rollers to prevent the unwound material from contacting said first set of take-up rollers until the material has passed over the uppermost portions of said first set of take-up rollers, to prevent any tendency of the material to unwind itself; and
- means for driving said take-up rollers to roll said unwound material.

3,917,184
METHOD AND APPARATUS FOR LOADING CASSETTES WITH MAGNETIC TAPE

James L. King, Sudbury, Mass., assignor to King Instrument Corporation, Westboro, Mass.

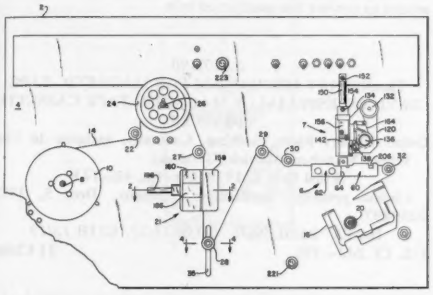
Filed Sept. 15, 1972, Ser. No. 289,471
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.[2] B65H *35/02*
U.S. Cl. 242—56.8 **4 Claims**

2. Apparatus for tailoring magnetic tape comprising:
- a first station having punching means for punching a hole in a tape;
- a second station having a splicing block adapted to support a tape;

knife means operative to sever a tape supported on said splicing block;

splicing tape applicator means for applying an adhesive splicing tape to the adjacent ends of two different tapes supported on said splicing block;

means including a winding spindle adapted to support a tape cassette hub, and drive means for rotating said winding spindle for transporting a tape through said first and second stations and winding it on the hub supported by said spindle; and



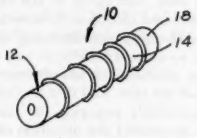
control means for operating the aforementioned means in the following sequence: actuating said punching means, operating said knife means, actuating said splicing tape applicator means, operating said drive means, terminating operation of said drive means, actuating said punching means, operating said drive means for a time sufficient for said winding spindle to wind a length of tape in excess of the length of the path followed by a tape passing from said tape punching means to said splicing block, terminating operation of said drive means, actuating said punching means, operating said knife means, and operating said splicing tape applicator means.

3,917,185

BUSINESS MACHINE CORE

Joel I. Canada, and Eugene A. Neal, both of Hartsville, S.C., assignors to Sonoco Products Company, Hartsville, S.C.

Filed Nov. 24, 1972, Ser. No. 309,401
Int. Cl.[2] B65H *17/02*
U.S. Cl. 242—68.5 **3 Claims**



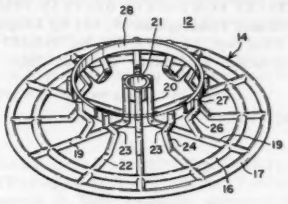
1. A core for use in the mounting and dispensing of a roll of paper tape in a business machine or the like, said core being formed of foam plastic and defining an elongated cylindrical body of a length sufficient so as to accommodate the width of a paper tape, a bore centrally in said body, an outer surface about said body for reception of the tape thereabout, and means on said surface for increasing frictional engagement between the surface and the paper tape, said means being centrally located on said core, terminating inward of the opposed ends of the core, and comprising spaced elongated projections extending from said surface.

3,917,186

MAGNETIC TAPE SPOOL

Nathan L. Solomon, New York, N.Y., assignor to Solo Products Corporation, Englewood, N.J.

Filed Feb. 15, 1974, Ser. No. 443,086
Int. Cl.[2] G11B *23/10;* **B65H** *75/18*
U.S. Cl. 242—71.8 **10 Claims**



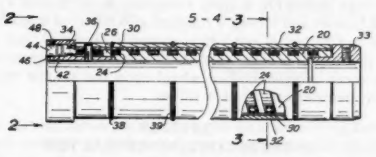
1. An endless magnetic tape cassette spool comprising a circular base, an inner sleeve mounted on and coaxial with said base, a plurality of resilient fingers projecting upwardly from said base and peripherally spaced about the axis of said base inwardly of the peripheral edge thereof and being outwardly concave, and a resilient collar extending between and joined to the upper inner faces of said fingers.

3,917,187

EXPANDING MANDREL OR CHUCK

Lawrence R. Damour, 16 Chesler Sq., Succasunna, N.J. 07876

Filed July 12, 1974, Ser. No. 488,160
Int. Cl. B65H *75/18*
U.S. Cl. 242—72 B **8 Claims**



1. An expanding mandrel in which the expanding member is actuated by air and the like, the expanding unit characterized as having a body member having its outer periphery formed with a helical groove in which is mounted a resilient tube with one end of the tube connected to means for feeding external air to said end of the tube and with the other end of the tube closed by means providing external air to said end of the tube and with the other end of the tube closed by means providing a fluid-tight seal, said expansible mandrel including: (a) a body member having an outer determined periphery in which is formed a helical groove of relatively constant width and depth; (b) a resilient tube carried and mounted in said groove, said tube in a nonexpanded and mounted condition having its outwardly facing surface disposed to lay substantially at the periphery of the body; (c) a plurality of longitudinally disposed movable jaw members carried by and on the intermediate portion of the body and providing all of the driving and support surface for a core of a reel, spool and the like, the underside of the movable jaw members in local contact with portions of the top surface of the resilient tube after the tube has been mounted in the helical groove, the movable members formed and positioned to engage and retain the outer surfaces of the mounted resilient tubing; (d) retaining and guide means carried by the body and slidably engaging the longitudinally disposed movable jaw members so as to cooperatively limit the outward movement of said movable jaw members while at the same time transmitting the developed torque forces to and from the movable jaw members to the body members, and (e) a fluid conductive and connecting

means cooperatively associated with the inlet end of the resilient tube, said conductive means permitting selective filling and discharge of pressurized air, fluid and the like to the helically arranged resilient tube to cause responsive outward and permit inward movement of the movable jaw members.

3,917,188
ACCELERATION SENSITIVE LOCKING DEVICE, ESPECIALLY FOR SAFETY BELTS IN VEHICLES

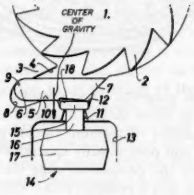
Karl Erik Nilsson, Fiskaregatan 49, 441 00 Alingsas, Sweden

Filed Sept. 19, 1973, Ser. No. 398,857

Claims priority, application Sweden, July 20, 1972, 12118/72

Int. Cl.[2] B65H *75/48*

U.S. Cl. 242—107.4 **6 Claims**



1. Acceleration sensitive locking device for vehicle safety belts at least partially coiled on a shaft comprising a toothed wheel connectable to the belt coil shaft, a housing having a chamber with an opening facing said toothed wheel and extending tangentially to said toothed wheel, said chamber having a rounded wall at one end, a slanted wall at its other end and a bottom beneath said opening which bottom extends between said ends and slants to said rounded wall providing a tilt edge therewith, a clasp extending between said ends on said bottom and having a rounded end adjacent said rounded wall and a pointed end adjacent said slanted wall, and means for pivoting said clasp on said tilt edge into engagement with one tooth of said toothed wheel upon the vehicle receiving above normal acceleration forces.

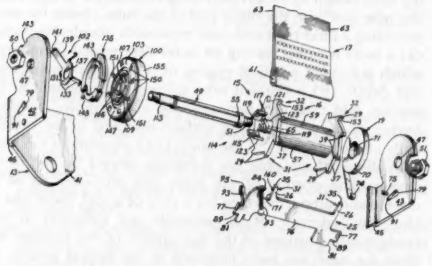
3,917,189
INERTIA LOCKING RETRACTOR

Medard Z. Bryll, Palos Park, Ill., assignor to Gateway Industries, Inc., Chicago, Ill.

Continuation of Ser. No. 257,372, May 26, 1972, abandoned. This application Dec. 17, 1973, Ser. No. 425,087

Int. Cl. A62b *35/00*

U.S. Cl. 242—107.4 **31 Claims**



1. A seat belt retractor comprising: support means, reel means rotatably mounted on said support means to rotate about a longitudinal axis, a belt mounted on said reel means for unwinding therefrom to be positioned about an occupant, biasing means biasing said reel means to rewind said belt on said reel means, a pair of ratchet wheels mounted on opposite sides of said reel means and turnable therewith, pawl means including a pair of pawls pivotally mounted on said support for movement into engagement with said ratchet wheels to block unwinding of said belt from said reel means, inertia operable means for pivoting said pawls into blocking engagement with said ratchet wheels at time of an accident, tension relieving means operable by manipulation of said belt comprising a member coupled to said reel means and a detent means engageable with said member to hold said reel means against turning in the retracting direction and relieving the extended belt from the tension of said biasing means, and means including a cam means operable upon a subsequent protraction of said belt for disabling said detent means and allowing said reel means to rewind the protracted belt.

3,917,190
TRANSPORT MECHANISM FOR MAGNETIC-TAPE DEVICES, ESPECIALLY MAGNETIC TAPE CASSETTE DEVICES

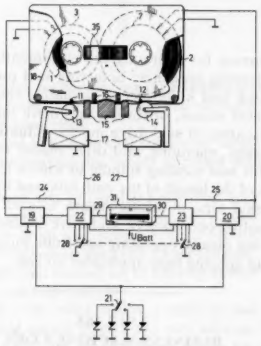
Oskar Hubert Richt, Socking, Germany, assignor to Uher Werke Munchen, Munich, Germany

Filed Dec. 4, 1973, Ser. No. 421,723

Claims priority, application Germany, Dec. 5, 1972, 2259497

Int. Cl.[2] B65H *59/38*; **G03B** *15/32*; **G11B** *15/13*

U.S. Cl. 242—191 **11 Claims**



1. In a magnetic tape machine having two spools between which magnetic tape is transferred, the combination of:

a pair of tape-driving spindles positioned to be engaged by tape passing from one spool to the other, one spindle being driven in one direction to unwind tape from said one spool and the other spindle being driven in the opposite direction to unwind tape from said other spool, each spindle being rotated at a speed determining a desired linear speed of the tape, and first and second pinch roller means for selectively engaging the tape against one of said spindles to control the direction of tape movement; direct drive means for holding back said one spool and for driving said other spool to take-up tape thereon when tape is being unwound from said one spool and vice versa, said direct drive means including at least one D.C. motor/generator; and

control means for controlling the voltage at said motor/generator, said control means including a comparator having a first input connected to said motor/generator, a second input connected to a reference voltage source which corresponds to said desired linear speed of the tape, and an output connected back to said first input whereby to energize said motor/generator to control tension in the tape.

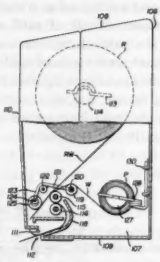
3,917,191
PAPER TOWEL DISPENSER AND TRANSFER MECHANISM

Andrew Stuard Graham, Jr., Wyncote, and Coleman David Berg, Philadelphia, both of Pa., assignors to Fort Howard Paper Company, Green Bay, Wis.

Continuation-in-part of Ser. No. 243,230, April 12, 1972, abandoned. This application Aug. 27, 1973, Ser. No. 391,655

Int. Cl.[2] **B65H** *19/04, 19/10, 25/00*

U.S. Cl. 242—55.3 **9 Claims**



1. A towel dispenser for sequentially dispensing toweling from rolls supported within the dispenser, comprising:

a first roll station for rotatably supporting a first towel roll, a second roll station for rotatably supporting a second towel roll, spaced from said first station, a feed mechanism spaced from said roll stations receiving the web from either of the towel rolls and dispensing the toweling, tensioning means longitudinally tensioning an unsupported free travel portion of the first towel web between said first towel station and said feed mechanism when feeding said first towel roll, and a transfer means for transferring the web of the towel roll in the second station to said feed mechanism when the tension in the web of the towel roll in said first station is broken, and a sensing means biased against said longitudinally tensioned free travel portion of the first towel web for sensing the longitudinal tension therein and responsive to a loss in the longitudinal tension in said free travel portion in the first towel web to actuate said transfer means and deliver the web of the second towel roll to said feed mechanism and thereby initiate dispensing of said second towel roll.

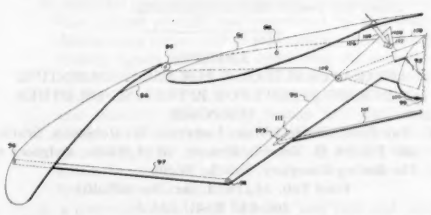
3,917,192
FLAP MECHANISMS AND APPARATUS

Alberto Alvarez-Calderon, Avenida Salaverry 3465, Orrantia del Mar, Lima, Peru

Continuation-in-part of Ser. No. 377,621, July 9, 1973, Pat. No. 3,897,029. This application Dec. 10, 1973, Ser. No. 423,012

Int. Cl.[2] **B64C** *9/26*

U.S. Cl. 244—42 D **6 Claims**



3. A wing having a spanwise edge portion; a first flap mounted adjacent to a lower surface of said spanwise portion in a retracted position and adapted to be moved in a chordwise direction and downwardly to an extended position increaseing the chord and camber of said wings; means to move said flap comprising:

a. mechanical means extending in an approximately spanwise direction and in a low drag disposition when said flap is in said retracted position;

b. powered means to rotate said mechanical means to a downwardly position in which said mechanical means are approximately in a chordwise plane supporting said flap in said extended position, with said mechanical means being rotated about an axis of articulation located in a plane which is approximately chordwise and inclined at a large angle to said wing.

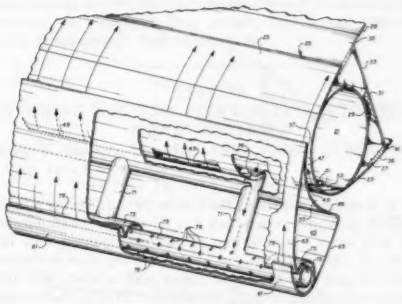
3,917,193
BOUNDARY LAYER CONTROL AND ANTI-ICING APPARATUS FOR AN AIRCRAFT WING

Joe Neal Runnels, Jr., Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jan. 21, 1974, Ser. No. 435,251

Int. Cl.[2] **B64C** *21/04;* **B64D** *15/02*

U.S. Cl. 244—42 CC **12 Claims**



1. A thermal anti-icing apparatus for an aircraft wing having at least one jet engine associated therewith, said thermal anti-icing apparatus comprising:

1. a duct mounted in the nose of said wing so as to be in direct thermal communication with the outer surface of the tip of said nose, said duct being adapted to carry relatively high temperature air bled from said at least one jet engine and, thereby, warm said nose of said wing;

2. thermal expansion attachment means for attaching said duct to said wing in a manner such that said duct can expand and contract as the temperature of the air carried by said duct changes without said expansion and contraction having a detrimental effect on the overall structure of said wing, said thermal expansion attachment means including:

a. an upper, outwardly projecting plate having one edge attached to said duct;

b. an upper slip joint suitable for attaching an edge of said upper, outwardly projecting plate, remote from said edge attaching said upper, outwardly projecting plate to said duct, to the upper surface of said wing;

c. a lower, outwardly projecting plate having one edge attached to said duct;

d. a lower slip joint suitable for connecting one edge of said lower, outwardly projecting plate, remote from said edge attaching said lower, outwardly projecting plate to said duct, to said lower surface of said wing; and,

e. a longitudinal, dove tail slip joint comprising a male member affixed to one of said duct and said wing and a female member affixed to the other of said duct and said wing, the interface between said male and female

members being loose to allow said duct to thermally expand and contract; and

3. first aperture means formed in said duct for allowing said high temperature air bled from said at least one jet engine to escape from said duct, said first aperture means including a plurality of apertures positioned such that escaping bleed air is directed so as to flow over the nose of said wing and, thence, over the upper surface of said wing.

3,917,194

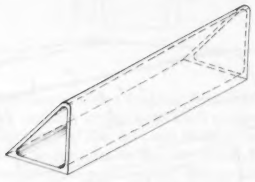
AUTOMATICALLY OPERATING DEVICE FOR SEALING A FUSELAGE RECESS OF AIRCRAFTS

Gunther Muller, Krailling, Germany, assignor to Messerschmitt-Bolkow-Blohm GmbH, Munich, Germany

Division of Ser. No. 287,268, Sept. 8, 1972, Pat. No. 3,797,784. This application Jan. 10, 1974, Ser. No. 432,400
Claims priority, application Germany, Sept. 13, 1971, 2145618

Int. Cl.[2] B64C *3/40*

U.S. Cl. 244—46 **2 Claims**



1. A sealing apparatus for use on aircraft having a fuselage and wings whose sweep-back can be varied, the trailing edges of said wings entering into sidewardly opening slots in the sides of said fuselage as the angle of sweep-back is increased, each of said slots having an upper wall, a lower wall and an inner wall spaced inwardly of said aircraft from outer edges of said slot, said sealing apparatus including a sealing arrangement in each of said slots, comprising the improvement wherein each of said sealing arrangements includes a pair of vertically spaced, elongated, hollow and noninflatable elastic elements having continuous and uninterrupted triangularly-shaped external surface, the hollow interior of said elastic elements being triangularly-shaped so that said elastic elements have a uniform wall thickness, one of said elastic elements being secured to said upper wall and the other of said elastic elements being secured to said lower wall, said vertically spaced pair of elastic elements engaging each other throughout their length and being slightly elastically deformed by (1) said engagement with each other and (2) an engagement with said wings of said aircraft.

3,917,195

VERTICAL/SHORT TAKE-OFF AND LANDING AIRCRAFT

Yoshiyuki Oguri, 9-7, 7-chome, Minami-Aoyama, Japan

Filed Dec. 5, 1973, Ser. No. 422,532
Int. Cl.[2] B64C *27/52*

U.S. Cl. 244—66 **3 Claims**

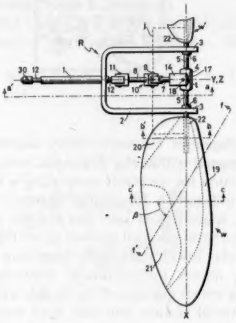
1. A propeller rotatable about a substantially longitudinal and normally horizontal thrust axis in an airborne vehicle, for imparting to the vehicle both lifting force and thrust in one direction along said axis, said propeller having a plurality of blades, each of which is elongated radially to said thrust axis and continuously so varies its pitch angle relative to said axis, in the course of a propeller revolution, as to be disposed at a substantially high pitch in the downwardly moving portion of its orbit and at a substantially low pitch in the upwardly moving portion of its orbit, said propeller comprising:

A. a frame having

1. a base portion which extends across said thrust axis and which is connectable with drive means for imparting rotation to the propeller, and

2. blade supporting portions, one for each blade, fixed to said base portion and extending therefrom in one direction parallel to said thrust axis, said blade supporting portions being radially spaced from said thrust axis;

B. a shaft element for each blade, each of said shaft elements extending through the blade supporting portion for its blade to have an inner end within the frame and to have an outer end anchored to a radially inner portion of its blade, the axes of all of said shaft elements being perpendicular to said thrust axis and intersecting the same at one point, and each of said shaft elements being confined to rotation about its axis in opposite directions relative to the frame, for increase and decrease of the pitch of its blade, and being thus constrained to move bodily with rotation of the frame;



C. a first pitch control member fixable relative to the vehicle in a position spaced vertically to one side of the thrust axis;

D. a second pitch control member between said blade supporting portions of the frame;

E. means providing a connection between the first and second pitch control members whereby the second pitch control member is rotatable relative to the first pitch control member about a rotation axis which is oblique to the thrust axis and which passes through said point and through at least a portion of the first pitch control member; and

F. means providing a swivel connection between the second pitch control member and each of the shaft elements, whereby the second pitch control member is confined to motion relative to the shaft elements in opposite directions about a swiveling axis which extends through said point and which is perpendicular to each of the rotation axis and the shaft element axes, the last mentioned means constraining the second pitch control member and said shaft elements to rotate in unison, relative to the frame, about the axes of the shaft elements.

3,917,196

APPARATUS SUITABLE FOR USE IN ORIENTING AIRCRAFT FLIGHT FOR REFUELING OR OTHER PURPOSES

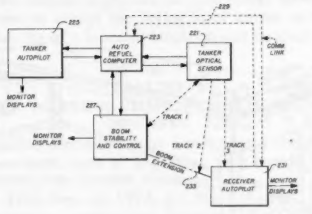
C. Ray Pond, Federal Way; Lawrence W. Robinson, Seattle, and Patrick D. Texeira, Renton, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Feb. 11, 1974, Ser. No. 441,401
Int. Cl.[2] B64C *13/18*

U.S. Cl. 244—77 R **18 Claims**

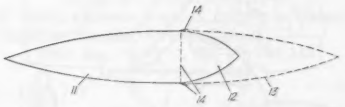
1. Apparatus suitable for use in in-flight orienting a first aircraft with respect to a second aircraft comprising:

1. reflection means mounted on said first aircraft for receiving a portion of an electromagnetic beam transmitted by a source of electromagnetic energy and reflecting said portion of said electromagnetic beam back toward the electromagnetic source of said electromagnetic beam;
2. a sensor mounted on said second aircraft, said sensor comprising:
   a. electromagnetic transmisssion means for transmitting an electromagnetic beam in a predetermined direction over a predetermined field of view;
   b. electromagnetic receiving means for receiving the portion of said transmitted electromagnetic beam reflected by said reflection means mounted on said first aircraft when said first aircraft is in said field of view;
   c. position determining means coupled to said electromagnetic receiving means for determining the position of said portion of said transmitted electromagnetic beam reflected by said reflection means when said reflection means is in said field of view; and,
   d. ranging means connected to said receiving means and said transmitting means for determining the time difference between the transmission of said transmitted electromagnetic beam and the reception of said portion of said transmitted electromagnetic beam reflected by said reflection means and, thus, the range between said first aircraft and second aircraft;
3. display means mounted in said second aircraft and connected to said position determining means and said ranging means for displaying the position of said first aircraft with respect to said second aircraft, and the range between said first aircraft and said second aircraft; and,



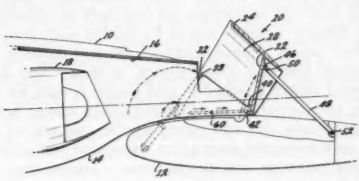
4. control means connected to said position determining means and to said ranging means for receiving signals related to the position of said portion of said electromagnetic beam reflected by said reflection means in said field of view and the range between said first and second aircraft and, in accordance therewith, controlling the position of said first aircraft with respect to said second aircraft, said control means comprising:
   a. an autopilot mounted in said first aircraft and coupled to the controls of said first aircraft so as to control the movement of said first aircraft;
   b. autopilot control signal generating means mounted in said second aircraft and connected to said position determining means and to said ranging means for generating signals suitable for controlling the autopilot of said first aircraft and, thus, the movement of said first aircraft in accordance with the signals generated by said position determining means and said ranging means related to the position of said portion of said electromagnetic beam reflected by said reflection means in said field of view in the range between said first and second aircraft; and,
   c. a communication link between said first and second aircraft for transmitting the signals generated by said autopilot control means to said autopilot mounted in said first aircraft.

3,917,197
AIRCRAFT
Robert Hugh Francis, Farnborough, England, assignor to Hawker-Siddeley Aviation Ltd., Surrey, England
Filed May 20, 1969, Ser. No. 828,096
Claims priority, application United Kingdom, May 21, 1968, 24246/68
Int. Cl. B64c *17/00*
U.S. Cl. 244—93 **4 Claims**



1. An aerodynamic body, such as an aircraft fuselage, for supersonic flight, having a rearwardly tapering rear end fairing suitable merely for subsonic flight, and means ejecting and burning fuel at the exterior of the fuselage substantially at the forward end of said rear end fairing and just ahead of the region where breakaway of the boundary layer would take place during supersonic flight in the absence of such burning, whereby the excessive drag penalty that would otherwise occur in supersonic flight is overcome.

3,917,198
OVERWING POST EXIT BLOCKER/DEFLECTOR DOOR THRUST REVERSER
Dennis E. Sanders, San Diego, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.
Filed June 21, 1974, Ser. No. 481,525
Int. Cl.[2] B64C *15/08*
U.S. Cl. 244—110 B **8 Claims**



1. In a thrust reverser utilized on a wing mounted jet engine powered aircraft discharging exhaust gases over the wing thereof, said jet engine housed in a nacelle having inner and outer skins and said nacelle being affixed to the forward part of the wing of the aircraft, the lower portion of the nacelle being appropriately contoured for connection to said wing such that the outer skin on said lower portion forms a continuous aerodynamic profile with said wing, said reverser comprising a deflector door, in the stowed position said deflector door forming a part of the aerodynamic profile of said outer skin of said nacelle, said deflector door having a translatable pivot point for pivoting and translating aft of said nacelle to a deployed position wherein the oncoming airstream is deflected with a forward velocity component, said deflector door including depending side flaps adapted to prevent the passage of exhaust gases through the sides of said reverser, means operatively connected to said flaps to selectively control the pivoting and translating of said deflector door, actuating means active on said linkage means, and effective to pivot said linkage means to its deployed position and said linkage means being operatively connected to said deflector door, a blocker door pivotally connected to said flaps and swingable to a deployed airstream jamming position, the rotation of said blocker door being counter to the rotation of said deflector door.

3,917,199

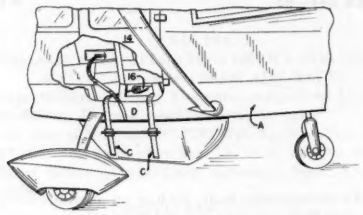
DETACHABLE POD FOR AERIAL PHOTOGRAPHY

Nick R. Dewitt, Portola Valley, Calif., assignor to Bechtel International Corporation, San Francisco, Calif.

Filed June 10, 1974, Ser. No. 477,952

Int. Cl.[2] B64D *47/08*

U.S. Cl. 244—118 R **12 Claims**



12. A camera containing pod for attachment to the underside of an unmodified aircraft exterior comprising: a pod having a rounded exterior and hollow interior, said pod disposed so that said interior confronts the unmodified underside of said aircraft, said pod having a thickness below said aircraft less than the thickness between said aircraft and a runway on which said aircraft can rest; means for removably securing said pod to the unmodified exterior of said aircraft including at least one strap passing around said pod at its lower end; said aircraft having a cockpit at its upper end through which said strap may be passed; means for tightening said strap with said pod there between to the unmodified belly of said aircraft; an aperture provided in the bottom of said pod having an overlying camera mount for at least one camera thereon; a gimbal support for supporting said camera mount including at least one gimbal portion said gimbal portion pivoted about substantially horizontal axis; at least one servomotor for angularly positioning said gimbal portion; a power source for driving said servomotor including power communication means between said servomotor and said power source; at least a first gravity referenced switch attached to said gimbal portion for interrupting said power to said communication means between said servomotor and said power source; said gravity referenced switch opening upon a first disposition with respect to a gravity reference and closing upon a second disposition with respect to a gravity reference; and, circuit means upon closure of said gravity referenced switch for driving said servomotor to open said gravity referenced switch through motion of said gimbal portion whereby said camera mount is maintained in a preselected disposition to the gravity reference of said aircraft.

3,917,200

PNEUMATIC BOOM SUPPORT FOR HAND TOOLS

Jay Johnson, 5350 Jessen Drive, La Canada, Calif. 91011

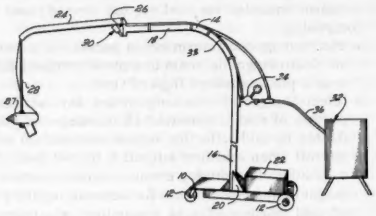
Filed Dec. 14, 1973, Ser. No. 424,907

Int. Cl.[2] B66D *1/00;* **A47F** *5/00*

U.S. Cl. 248—13 **5 Claims**

1. A movable support for a hand-manipulated tool, such as a spray gun, permitting a wide range of movement in both vertical and horizontal direction, comprising:

a support member including a substantially horizontally extending first boom, a second boom forming an extension of said first boom, hinge means connecting one end of the second boom to the free end of said first boom, the hinge means providing movement of the second boom relatively to the first boom about a vertical as well as horizontal axis, means connecting the load to the other end of the second boom, a pneumatic linear actuator including a cylinder and piston, means, including at least a part of the hinge means, connecting one end of the actuator to the second boom and the other end of the actuator to the first boom such that the length of the actuator changes with vertical movement of the second boom about the horizontal axis of the hinge means, and



means including a pneumatic pressure regulator connecting the cylinder to a pressurized pneumatic source, the regulator pressurizing the actuator sufficiently to counterbalance the weight of the second boom and load.

3,917,201

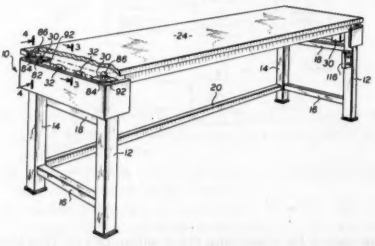
VIBRATION ISOLATED TABLE WITH IMPROVED MOUNTS

Guy Roll, Wantagh, N.Y., assignor to Ehrenreich Photo Optical Industries, Inc., Garden City, N.Y.

Filed Nov. 7, 1974, Ser. No. 521,888

Int. Cl.[2] F16F *15/00*

U.S. Cl. 248—20 **19 Claims**



1. A vibration isolation table including in combination a supporting frame that rests on an underlying surface which is subject to vibration, a high inertia table top supported from said frame, vibration damping mounts between the table top and the supporting frame, each of said mounts comprising a flexible envelope of substantially annular cross section, a thrust element located between the flexible envelope and the table, and a retainer plate fixed to the frame and having an opening through which a part of the thrust element extends, said plate being in a position between the table and a surface of the thrust element, the retainer having a surface that confronts said surface of the thrust element and that constitutes a mechanical stop to limit motion of the thrust element in the direction that the thrust element is moved by gas pressure in the envelope.

3,917,202

TERMINAL BLOCK MOUNTING BRACKET

Ernest William Reinwall, Jr., McHenry; Edmund J. Soltysik, Chicago, and Richard Jay Lindeman, Elmwood Park, all of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

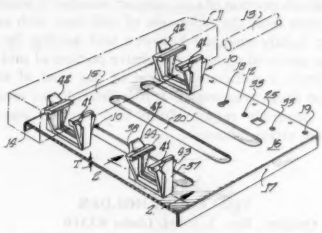
Filed June 24, 1974, Ser. No. 482,218

Int. Cl.[2] F16L *3/22;* **H02B** *1/02*

U.S. Cl. 248—68 R **13 Claims**

1. A bracket for retaining a rectilinear terminal block or the like at an apertured stand-off position above a backboard or a like mount, comprising a base, a fastener for securing the

bracket base to the backboard in a predetermined location and in a predetermined angular orientation, at least two opposed upstanding primary arms at opposite base sides and shoulder means located adjacent the free end of each primary arm and adapted to engage and support the terminal block underside over an extended distance at the stand-off position above the base, at least two opposed secondary arms extending upwardly from opposite sides of the base adjacent said primary arms and having an extent substantially greater than



said primary shoulder carrying arms, each of said secondary arms including retainer means for engaging the terminal block and locking the block and bracket together in predetermined angular relationship, said shoulder means including a cantilever-like flange extending inwardly in opposed relation from each primary arm toward the other primary arm and terminating in spaced relation to provide an open throat between said primary arms to accept the laying in of cables or the like before mounting of a terminal block on said bracket.

3,917,203

MOVABLE WORKING CHAIR, PARTICULARLY FOR DENTISTS

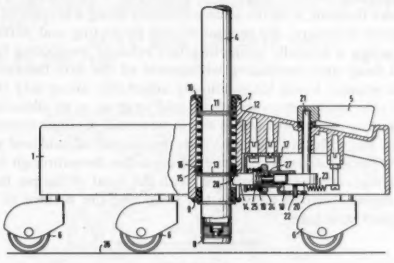
Erich Heubeck, Bensheim, and Ernst-August Behne, Bensheim-Auerbach, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Nov. 13, 1973, Ser. No. 415,450

Claims priority, application Germany, Nov. 16, 1972, 2256336

Int. Cl.² F16M *13/00*

U.S. Cl. 248—158 **3 Claims**



1. A movable working chair, particularly for dentists, comprising a base having means for rolling the chair along the floor, a seat and a support member carrying said seat, brake means connected to said support member for movement from a release position wherein brake means is spaced from the floor to a braking position wherein the brake means engage the floor in response to loading of said seat, restoring means for moving said brake means from the braking position to the release position in response to unloading of said seat, and stop means movable between a retracted and extended position for selectively blocking movement of said brake means, and stop means in said retracted position permitting movement of said brake means between said braking and release positions, and in said extended position permitting movement of said brake means only from said braking position to said release position, said stop members having connected thereto manually operable preselecting means for biasing said stop means into either one of said retracted and extended positions irrespective of the position of said brake means and the seat's load.

3,917,204

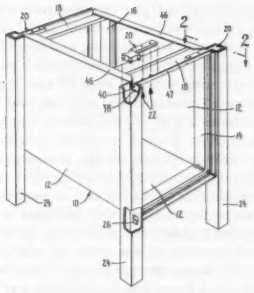
SUPPORT AND MOUNTING

Ernst G. Himsl, Kitchener, Canada, assignor to Massey-Ferguson Industries Limited, Toronto, Canada

Filed Aug. 28, 1972, Ser. No. 284,330

Int. Cl.² F16M *11/16*

U.S. Cl. 248—188 **7 Claims**



1. Apparatus for supporting a structure comprising, a support alongside the structure and a mounting, means for receiving said mounting, said means for receiving being on said support, an arm attached to said mounting for attachment of said mounting in a cantilever manner with respect to said structure, and caming surfaces on said mounting for frictionally engaging said receiving means to maintain said support on said mounting by said camming surfaces applying outward force on said receiving means and prevent said support from rotating on said mounting relative to the structure, a neck portion, said neck portion connecting said mounting with said arm, a slot in said structure, said neck portion having a cross section of a size to snugly engage said slot.

3,917,205

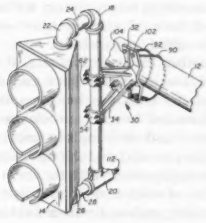
CONNECTOR FOR TRAFFIC SIGNAL LIGHTS

Danny Meadors, Oklahoma City, Okla., assignor to Southwestern Electric Company, Inc., Oklahoma City, Okla.

Filed Apr. 8, 1974, Ser. No. 458,751

Int. Cl.² F16M *13/00*

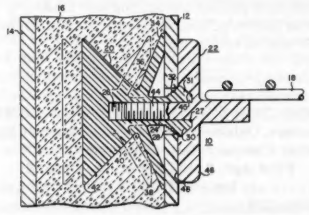
U.S. Cl. 248—229 **1 Claim**



1. An apparatus for securing a first longitudinally extending member in fixed spaced and offset relation with respect to a

second longitudinally extending member comprising, a first clamping device having clamping means thereon for securing said first clamping device to said first elongated member, a second clamping device having clamping means thereon for securing said second clamping device to said second elongated member, said first clamping device having a cylindrical recess therein, said cylindrical recess having a bottom surface with radial splines thereon, said second clamping device having a cylindrical projection adapted to be received in said cylindrical recess, said cylindrical projection having a forward surface at one end thereof with radial splines thereon adapted to engage the radial splines on the bottom surface of said cylindrical recess, and means for securing said cylindrical projection in said cylindrical recess to prevent relative rotation between said cylindrical projection and said cylindrical recess, said forward and bottom surfaces being substantially flat with radial splines thereon, and said first clamping device being a generally Y-shaped member having a hollow cylindrical base with a pair of divergent legs extending outwardly therefrom, wherein said cylindrical base contains said cylindrical recess and wherein the means for clamping said first clamping device to said first elongated member comprises a pair of clamping members cooperating with the ends of said legs for engaging said first elongated member, and wherein said second clamping device includes a pair of transversely extending ears connected to each other through a central concave portion, and wherein said central concave portion is connected to a central cylindrical hub constituting said cylindrical projection, and wherein the means for clamping said second clamping device to said second elongated member includes a pair of cables connected to one transversely extending ear around said second elongated member to the other of said transversely extending ears and means operatively connected with said cables and with said other transversely extending ear to tighten said cables on said second transversely extending member.

3,917,206
REFRIGERATOR SHELF SUPPORT ASSEMBLY
Richard D. Fisher, Worthington, Ohio, assignor to White-Westinghouse Corporation, Cleveland, Ohio
Filed Apr. 5, 1974, Ser. No. 458,256
Int. Cl.[2] A47G *29/02*
U.S. Cl. 248—239 **8 Claims**



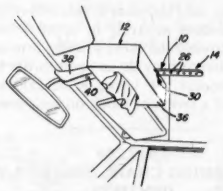
1. A support assembly for mounting within a circular aperture in the food liner of a refrigerator employing foamed insulation, said assembly comprising:

an anchor member for insertion in said circular aperture from the back side of said liner said member having a generally tubular body portion open at one end into an internally threaded bore, a circular periphery adjacent said open end and defining abutment means generally complementary to said circular aperture in said liner for interference engagement with the inner side of said liner for retention of said end in said aperture, and flange means extending outwardly from said body from a position axially rearwardly of said open end, said flange being generally concave and terminating in an annular sealing lip for facing engagement with the back side of said liner; and,

a support member comprising an externally threaded shank portion for receipt in said bore and an enlarged head portion defining a substantially planar face on the side thereof towards said shank, said planar face having an area at least coextensive with said sealing lip, and means extending inwardly for supportingly engaging shelf structure;

whereby in assembly, said open end of said anchor member is received in said circular aperture in said liner from the back side prior to the introduction of foam insulation and said shank portion of said support member is inserted into said bore from the front side of said liner with said liner being tightly engaged between said sealing lip of said flange and said planar coextensive portion of said head to distribute a sufficient portion of the load of said supported shelf, transmitted to the liner, to an area of the liner generally remote from said circular aperture to prevent stress failures.

3,917,207
TISSUE BOX HOLDER
Earle W. Quigley, Rte. 3, Buhl, Idaho 83316
Filed Aug. 19, 1974, Ser. No. 498,728
Int. Cl.[2] F16M *13/00*
U.S. Cl. 248—311 **3 Claims**

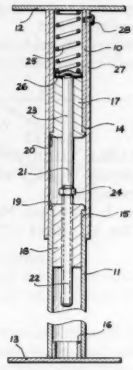


1. A tissue box holder for use in the home, automobile, or the like, said holder comprising a flat elongated strap having an elongated central portion and opposed end portions, said strap being selectively insertable through a pair of opposed walls of a tissue box with the central portion of the strap received along the bottom of the box and the opposed end portions projecting beyond said opposed walls of the box, one of said projecting end portions comprising a mounting end engageable with a support structure for a mounting of the holder thereon, with the strap extending along a surface of the support structure, the second of said projecting end portions including a laterally projecting box retainer projecting from said strap and precluding withdrawal of the box therefrom, said retainer being longitudinally adjustable along said strap and selectively removable from said strap so as to allow for a mounting and removal of a tissue box, said retainer comprising a pin with an enlarged head, the second of said end portions having a series of pin receiving holes therethrough for a selective reception of said pin, with the head of the pin being arranged clamped between the strap and the surface of the support structure.

3,917,208
ADJUSTABLE COLUMNS
John Magers, 34 Station St., Harris Park, New South Wales, Australia (2150)
Filed Sept. 5, 1974, Ser. No. 503,309
Int. Cl.[2] E04G *25/00;* **A47H** *1/08*
U.S. Cl. 248—356 **5 Claims**

1. An adjustable column comprising first and second tubular members axially aligned with each other and with abutment engaging portions at their distal ends, one of said members having a threaded portion and the other a socket portion to respectively receive an extension member having a co-operating threaded part at one end and a co-operating socket

engaging part at the other end, the said members being displaced with respect to each other by rotation of said extension member with respect to the threaded portion to extend or shorten the distance between the abutment engaging portions, a buffer member in said first tubular member, a resilient member in said first tubular member between said abutment engaging portion and said buffer member and urging the buffer member toward the socket portion, the socket engaging part of the extension member engaging the buffer member, as the

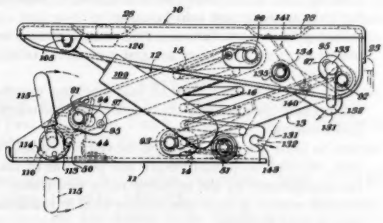


abutment engaging portions are urged against fixed abutments, to compress the resilient member as the extension member is rotated with respect to the threaded portion to extend the distance between the abutment engaging portions, the socket portion and threaded portion having flanged parts at their adjacent ends to retain them in position in said tubular members, and the first tubular member being sheathed with a casing member which extends to cover the second tubular member.

3,917,209
VEHICLE SEAT SUPPORT

Albert John Adams, Fetcham, England, assignor to A. W. Chapman Limited, Great Britain

Filed July 10, 1974, Ser. No. 487,373
Claims priority, application United Kingdom, July 24, 1973, 35228/73
Int. Cl.[2] B61L *5/00*; **E01B** *7/00*
U.S. Cl. 248—399 **8 Claims**

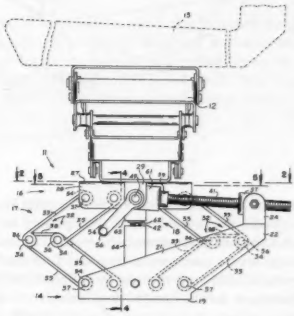


1. A vehicle seat support which includes a seat pan assembly intended to support a vehicle seat, a rigidly connected base plate assembly intended to be mounted on the floor of a vehicle, parallel links mechanism connecting the seat pan assembly and the base plate assembly to one another, a first spring abutment on the base plate assembly and a second spring abutment on one of the links of said parallel link mechanism, a compression spring acting between said abutments, and a rotatable adjusting means operable to effect the adjustment of the distance between the first and the second spring abutments, the axis of rotation of said adjusting means being fixed in relation to said base plate assembly and said adjusting means acting between said base plate assembly and said one of said links.

3,917,210
ADJUSTABLE SUPPORT FOR VEHICLE SEATS

Herscheal W. Miller, 432 Fairmount, Davenport, Iowa 52802

Filed Aug. 6, 1974, Ser. No. 495,207
Int. Cl.[2] B60N *1/02*
U.S. Cl. 248—419 **7 Claims**



1. An adjustable support for vehicle seats comprising:

a first means for support having a base member and first side members, said base being placed adjacent the surface of the vehicle and affixed thereto, said first side members being integrally formed with and along opposite edges of said base member and upturned therefrom;

a second means for support having a plate member and second side members, said plate member being affixed to the seat of the vehicle, said second side members being integrally formed with and along opposite edges of said plate member and downwardly disposed therefrom;

a third means for support having a plurality of adjustable units, each of said adjustable units being hinged intermediate its ends and being pivotally affixed at one end between said first side members and at the other end between said second side members; and

a means for adjusting the horizontal and vertical relationship of said second means for support with respect to said first means for support, said means for adjusting having a horizontal adjustment bolt, a vertical adjustment bolt, and a means for selectively engaging and cranking said horizontal and said vertical adjustment bolts, said horizontal adjustment bolt being pivotally affixed at one end to one of said first side members and at the other end to one of said second side members, said horizontal adjustment bolt being disposed outside of the space enclosed by said first means and said second means and on the side of the plane formed by said one of said first side members and said one of said second side members opposite the side where said third means is disposed, said vertical adjustment bolt extending between and being pivotally affixed to said first side members and said second side members, said means for engaging and cranking being affixed to said one of said second side members and extending to the same side of said plane as said horizontal adjustment bolt.

3,917,211

DEVICE FOR VARYING THE VERTICAL SEPARATION AND THE RELATIVE LONGITUDINAL INCLINATION

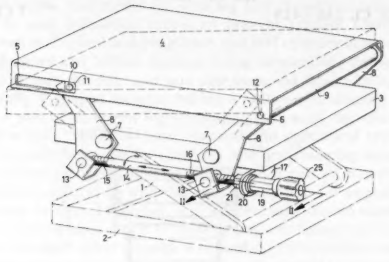
Heinz Daunderer, and Hermann Meiller, both of Amberg, Germany, assignors to Georg Grammer, Germany

Filed Jan. 16, 1974, Ser. No. 433,725

Claims priority, application Germany, Feb. 9, 1973, 2306478

Int. Cl.² F16M *13/00*

U.S. Cl. 248—421 **14 Claims**



1. A device for varying the vertical separation and relative inclination of two plate members, comprising in combination:

a. first and second plate members;

b. pivotal levers interconnecting said first and second plate members, said levers being mounted in tandem pairs;

c. adjustment means connecting said pivotal levers at connection points thereof one of said tandem pairs;

and

d. attachment means attaching said adjustment means to said first plate member, said adjustment means comprising a first mechanism for effecting relative closure and separation of the connection points, and a second mechanism operable independently of said first mechanism and in combination with said attachment means for effecting pivoting of the levers of said pair relative to the first plate member whilst maintaining a fixed separation between said connection points.

3,917,212

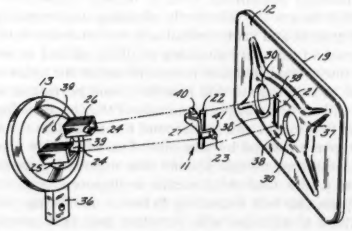
CROSS ARM MIRROR MOUNT FOR REMOTE CONTROL REARVIEW MIRRORS

Richard Marshall Hadley, Jackson, Tenn., and Robert James Fisher, Detroit, Mich., assignors to Harman International Industries, Inc., Detroit, Mich.

Filed Dec. 3, 1973, Ser. No. 421,399

Int. Cl.² A47G *1/24*

U.S. Cl. 248—487 **3 Claims**



1. A cross arm structure for limited universal support of remote controlled rearview mirrors and the like comprising:

a mirror back having an elongate grooved depression;

a pedestal mount having a pair of spaced-apart coaxial grooves;

a one piece structure having a first cylindrical element and defining a first axis engaged in said groove of said mirror back and said one piece structure having a second axis defined by a pair of spaced-apart coaxial cylindrical elements which, upon projection, intersects said first axis at right angles thereto and said pair of spaced-apart cylindrical elements resting in said grooves of said pedestal, one or more of said grooves restraining axial displacement of said one piece structure; and

tension means compressing said one piece structure between said mirror back and said pedestal.

3,917,213

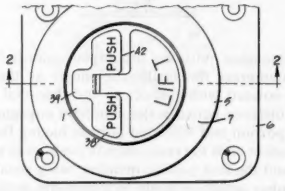
ADJUSTABLE TIEDOWN DEVICE

Paul W. Poehlmann, Stinson Beach, Calif., assignor to H. Koch & Sons, Inc., Anaheim, Calif.

Filed June 3, 1974, Ser. No. 475,654

Int. Cl.² B65J *1/22*

U.S. Cl. 248—509 **19 Claims**



1. In a tiedown device,

an anchor stud having a head and a hollow stem, said head being adapted to be engaged by a member to be tied down,

a housing,

a backing member in said hollow stem,

securing means to seecure said backing member to said housing so that said backing member is spaced from said housing and said hollow stem is movable between said backing member and said housing,

coacting guide means between said stem and said securing means to guide said stem in axial movement relatively to said housing,

resilient means bearing against said backing member and against said stem to urge said anchor stud outwardly from said housing,

means to limit the axial outward movement of said anchor stud, thereby to predetermine the position of said head for engagement by the member to be tied down,

releasable means to lock said anchor stud in retracted position in said housing,

and means to release said releasable locking means at will, said resilient means being a spring located within said hollow stem,

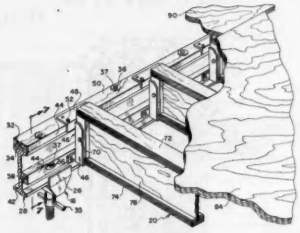
said securing means including a securing element extended across said housing in engagement with said backing member and being secured to said housing,

said coacting guide means including guide slots in said hollow stem riding over said securing element between said backing member and said housing during movement of the stem into and out of said housing.

3,917,214
FLYING FORM

Felix E. Ratcliff, Los Angeles, and Pierce J. Walinsky, Sunnyvale, both of Calif., assignors to Waco Scaffold & Shoring Co., Schiller Park, Ill.

Filed June 12, 1974, Ser. No. 478,698
Int. Cl.[2] E04G *11/38, 17/16*
U.S. Cl. 249—18 **14 Claims**



5. A flying form comprising:

a pair of parallel spaced metal beams disposed with parallel flanges along the head and bottom of their webs, respectively;

a wood header of substantial thickness rigidly secured to the upper face of the head flange and colevel wood strips secured a spaced distance above the bottom flange against the facing sides of said beam webs, said strips having a horizontal thickness substantially equal to the width of each head flange to define with the head flanges a pair of vertical parallel planes;

hanger means spaced along the tops of the wood headers facing each other in pairs and each having horizontal portions releasably secured against the top surface of the headers and a vertical portion lying in one of said vertical planes, said hanger means including depending stirrup members with upper edge portions secured to said vertical portion, and strap means secured to the lower edges of the stirrup member and releasably fastened against the side strip;

laminated wood joists each having a head rail and bottom rail inteerconnected by a web and of a height greater than the depth of said stirrup members whereby the head rail is located a substantial distance above the wood header with the lower rail well above the lower flange;

means releasably securing the ends of each joist between the sides of a stirrup member including filler blocks extending from rail to rail at both ends and on both sides of the web filling the spaces between the web and stirrup; and

clamping means interconnecting the stirrup members and said blocks and web in place against compression and tension forces exerted between the metal beams and the joists.

3,917,215
FORM WORK FOR CONCRETE CONSTRUCTION

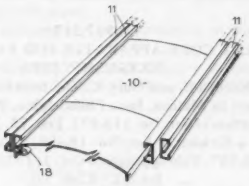
Ronald Fox, c/o Mrs. M. Smith, 25 Snydale Road, Normanton, Yorkshire WF6INT, England

Filed Sept. 6, 1973, Ser. No. 394,617
Claims priority, application Australia, Sept. 7, 1972, 356/72; Dec. 12, 1972, 1590/72
Int. Cl.[2] E04G *11/04;* **E04B** *5/54*
U.S. Cl. 249—23 **6 Claims**

1. Apparatus for forming a removable false floor upon which wet concrete may be placed to from a slab, said apparatus including at least:

a. a pair of support beams which are adapted to be erected at an elevated position, at which they extend horizontally and parallel to one another, and to co-operate with removable panel support means; and,

b. a plurality of arched form panels arranged to fit neatly between said beams and to be affixed thereto by means of said support means; said panels being removable from their operative attitude between said beams by extracting said panel support means after a concrete slab formed thereon has set, each of said support beams comprising a vertically disposed web adapted to co-operate with said panels by bearing against their edges when they are

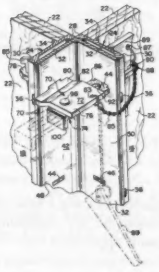


loaded and at least one horizontally disposed flange at the lower end of the vertically disposed web adapted to co-operate with said support means by preventing downward movement of said support means when said panels are loaded, said horizontally disposed flange having a vertically disposed flange at its edge remote from the vertically disposed web.

3,917,216
ARTICULATED CONCRETE COLUMN FORM WITH NOVEL CORNER FASTENING DEVICE

Russell H. Plough, Chicago, Ill., assignor to Symons Corporation, Des Plaines, Ill.

Filed Mar. 25, 1974, Ser. No. 454,721
Int. Cl.[2] E04G *13/02*
U.S. Cl. 249—48 **8 Claims**



1. In a concrete form of the type that comprises a series of upstanding rectangular panels two of which are in contiguous relationship, extend at a right angle to each other and have along their adjacent side edges outwardly extending flange-like members which extend at a right angle to each other and have transverse slots therein at substantially the same level, the improvement which comprises a fastening device adapted releasably to retain the two panels in their normal position of contiguity and comprising a first T-bolt embodying a plate-like body portion at one end thereof and a reduced longitudinally slotted shank at its other end, and having its body portion disposed in the space between the two flange-like members and abutting against one of said flange-like members and its shank portion extending through and beyond the transverse slot in said one flange-like member, an elongated second T-bolt embodying a body portion at one end thereof and a reduced longitudinally slotted shank portion at its other end, having its body portion slidably connected to the body portion of the first T-bolt so that it is slidable transversely thereon, and adapted when so slid in a direction normal to the other flange-like member to have its shank portion extend through the slot

in said other flange-like member, and wedge pieces projecting through the longitudinally extending slots in the shank portions of the two T-bolts and serving when driven into place to draw the body portions of said T-bolts hard against their respective flange-like members.

3,917,217

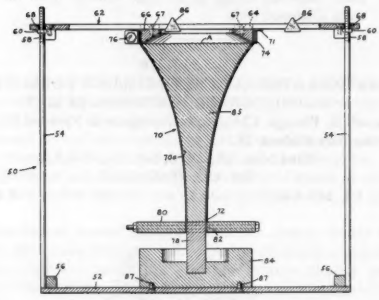
RESILIENT CORE APPARATUS FOR FABRICATION OF EXTRUSION DIES

Edward Korostoff, and Gary K. Zin, both of Philadelphia, Pa., assignors to Matcon, Inc., Philadelphia, Pa.

Continuation of Ser. No. 118,872, Feb. 25, 1971, abandoned, which is a division of Ser. No. 18,499, March 11, 1970, Pat. No. 3,588,987. This application Oct. 1, 1973, Ser. No. 402,296

Int. Cl.[2] B29C *1/12*

U.S. Cl. 249—183 **6 Claims**



1. Apparatus for manufacturing a liner for use as an internal contour for an extrusion die for extruding material from the exit port of an extrusion apparatus into a desired profile having a predetermined cross-sectional shape corresponding to an output orifice of the liner, the liner having an input orifice substantially similar to the exit port of the extrusion apparatus and its output orifice substantially similar to the cross-sectional shape of the desired profile and the input orifice having a different cross-sectional shape than the output orifice, comprising

a first fastening means,

a first member having a profile substantially similar to the input orifice of said liner,

a second fastening means,

a second member having a profile substantially similar to the desired profile,

a tubular elastomeric membrane having a first end and a second end, said first end of said tubular elastomeric membrane being secured by said first fastening means against said first member, and said second end of said tubular elastomeric membrane being secured by said second fastening means against said second member, to form a tunnel passage between said first member and said second member, and

a substantial portion of the membrane between said first end and said second end being free from contact with said fastening members.

3,917,218

DIFFERENTIAL SOLENOID VALVE FOR FLUID CONTROL

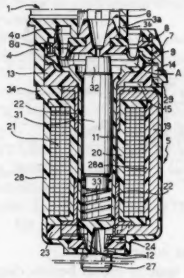
Antonio Marocco, Arma di Taggia (Imperia), Italy, assignor to Elge Establishment, Liechtenstein, Liechtenstein

Filed June 17, 1974, Ser. No. 480,173

Claims priority, application Italy, June 18, 1973, 68804/73

Int. Cl.[2] F16K *31/06*

U.S. Cl. 251—30 **8 Claims**



1. In a differential solenoid valve of the type comprising:

a valve body,

an inlet from the valve body,

an outer annular chamber communicating with said inlet,

an inner chamber coaxial with said outer annular chamber and communicating with said outlet,

a valve shutter located coaxially at one end of said inner and outer chambers, said valve shutter being movable axially of said chambers between a first position where it interrupts communication between said inner and outer chambers and a second position where it permits communication between said inner and outer chambers,

a diaphragm of resilient material, said diaphragm being attached to said valve shutter,

means tightly securing said diaphragm at its periphery to said valve body,

a fixed lower intermediate element housed in said valve body and defining a cavity in said valve body with which said diaphragm cooperates to define a pilot chamber separated by said diaphragm from said inner and outer coaxial chambers,

means defining a communication passageway between said pilot chamber and said outer annular chamber,

means defining a discharge opening between said pilot chamber and said outlet of said valve body, and

an axially movable electromagnet core the position of which is controlled by an electromagnet to close or open said discharge opening of said pilot chamber,

the improvement wherein:

said valve body includes a cylindrical part having an inner wall, said diaphragm is housed in said cylindrical part of said valve body,

recesses in said inner wall of said cylindrical part of said valve body,

said intermediate element has an axial tubular part with a closed end and an open end, a radial flange part at said open end of said axial tubular part, said radial flange part forming one wall of said pilot chamber, and said axial tubular part housing said movable core of said electromagnet,

resilient biasing means in said axial tubular part resiliently biasing said movable core of said electromagnet towards said open end of said axial tubular part,

a locking ring surrounding said axial tubular part of said intermediate element, and

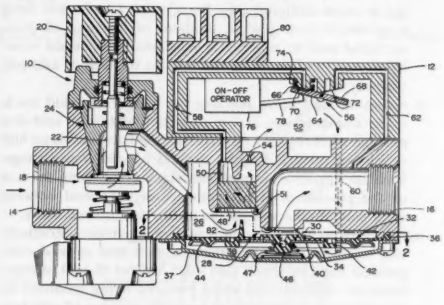
radial teeth projecting from said locking ring, said radial teeth of said locking ring being engageable in said reces-

ses in said inner wall of said cylindrical part of said valve body to form a bayonet coupling therewith connecting said intermediate element to said valve body.

3,917,219
PRESSURE OPERATED FLOW CONTROL DEVICE

Fred W. Hendrick, Los Angeles, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Sept. 4, 1973, Ser. No. 394,025
Int. Cl.[2] F16K *31/385*
U.S. Cl. 251—45 **7 Claims**



1. A flow control device comprising

a casing having inlet means, outlet means and interior wall means forming a flow passage therebetween;

main valve means including a valve seat disposed in said flow passage and diaphragm means cooperating with said valve seat to control flow between said inlet means and said outlet means, said diaphragm means having a first side defining an operating pressure chamber and a second side defining an inlet pressure chamber;

control means for operating said main valve means including a bleed line port in a portion of said interior wall means upstream of said valve seat, bleed line means communicating with said inlet pressure chamber at said bleed line port and with said flow passage downstream of said valve seat, bleed valve means controlling flow through said bleed line means, and passage means communicating with said bleed line means and said operating pressure chamber to subject said operating pressure chamber to inlet pressure to close said main valve means and to outlet pressure to open said main valve means, said portion of the interior wall means being substantially parallel to the flow passage; and

flow disrupting means extending into said flow passage to create turbulent flow adjacent said bleed line port whereby the pressure at said bleed line port is maintained at a level to close said main valve means even under high flow conditions;

said flow disrupting means being carried on said second side of said diaphragm means.

3,917,220
VALVE

Samuel E. Gilmore, P.O. Box 265, Bellaire, Tex. 77401

Continuation of Ser. No. 255,211, May 22, 1972, abandoned.
This application May 30, 1974, Ser. No. 474,576
Int. Cl.[2] F16K *3/18;* **F15B** *13/044;* **G05D** *16/00*
U.S. Cl. 251—86 **7 Claims**

1. Shear valve comprising a hollow valve body having flow ports thereto and including

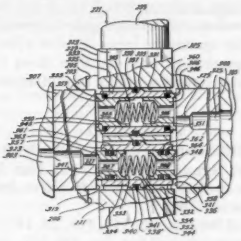
a pair of oppositely inwardly facing seal plates having parallel flat seat faces, at least one of said plates having one of said ports therein with the seat face extending around the port,

a cage mounted in said body for movement parallel to said faces, said cage having a generally cylindrical opening therethrough providing a bearing whose axis is perpendicular to said seat faces,

two open ended seal tubes telescopically disposed in said bearing and slidingly sealed thereto, said tubes being biased outwardly toward said seat faces, said seal tubes having flat end faces both of which simultaneously are coplanar with their adjacent seat faces to simultaneously sealingly engage said seats,

stem means for translating said cage parallel to to said seats, and

means rockably mounting said cage relative to said stem means allowing both of said seal tubes simultaneously to



remain in seating engagment with said seat faces when said stem means rocks relative to said cage about an axis that is not perpendicular to said seat faces,

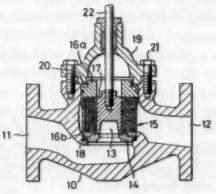
said cage being free of external constraints that would prevent it from rocking relative to said body to move said flat end faces of said tubes from position not coplanar with said flat seat faces to positon that is coplanar with said flat seat faces,

said seal tubes being free of constraints other than those imposed by said cage and seal plates whereby said seal tubes can both simultaneously and independently move into seating engagement with the adjacent seal plates while remaining sealed to the cage.

3,917,221
HIGH-PRESSURE-DROP VALVE

Shokichi Kubota, Matsudo, and Tadahiro Akiyama, Ichikawa, both of Japan, assignors to Tokico Ltd., Kawasaki, Japan

Filed Aug. 16, 1974, Ser. No. 498,225
Claims priority, application Japan, Aug. 20, 1973, 48-93150
Int. Cl.[2] F16K *47/08*
U.S. Cl. 251—127 **5 Claims**



1. A high-pressure-drop valve comprising: a valve body having a liquid inlet, a liquid outlet, and a valve chamber provided between and communicating with said inlet and outlet;

a cage of substantially hollow cylindrical shape fixedly accommodated within said valve chamber and comprising a plurality of cage units of hollow cylindrical shape having respectively different diameters and mutually fitted in a liquid-tight and concentric arrangement;

and a valve member fitted in the hollow interior of said cage and adapted to undergo slidable displacement therewithin, each of said cage units having a plurality of orifices opening at one cylindrical surface of the cage unit and a plurality of holes communicating respectively with said orifices and opening at the other cylindrical surface of the cage unit, said orifices of the cage units being formed to have mutual positional relationships such that the centerline of any orifice of any one cage unit does not coincide with the centerline of a corresponding orifice of a cage unit adjacent to said one cage unit, each of said holes having a diameter greater than that of each of the orifices in a manner communicable with the orifice of the adjacent cage, whereby liquid which has passed through each orifice and correspondings hole of said one cage unit first collides against the inner concave cylindrical surface of an adjacent cage unit and then flows from said hole into the corresponding orifice of said adjacent cage unit.

3,917,222

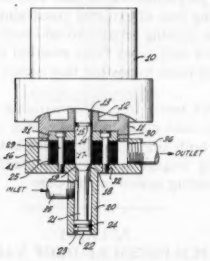
SOUND SUPPRESSING GAS FLOW CONTROL DEVICE

George J. Kay, Huntington Beach, and Alan Keskinen, Sun Valley, both of Calif., assignors to Vacco Industries, Inc., South El Monte, Calif.

Continuation of Ser. No. 445,111, Feb. 25, 1974, abandoned, which is a continuation of Ser. No. 276,831, July 31, 1972, abandoned. This application Jan. 6, 1975, Ser. No. 539,153

Int. Cl.[2] F15D *1/04*

U.S. Cl. 251—127 **7 Claims**



1. A constant velocity gas flow control device comprising:

a housing having an inlet and an outlet intercommunicated by a gas flow passage;

a rigid gas flow velocity control means rigidly mounted in said housing and having sufficient cross-sectional area to fully occupy the cross-sectional area of that portion of said flow passage in which said rigid means is mounted; said rigid means comprising a compressively loaded stack of planar members of abutting surface shape characteristics defining a plurality of rigidly inflexibly defined, clear unobstructed flow passageways therethrough, between adjacent pairs of said planar members, oriented to intercommunicate inlet and outlet portions of said flow passage, each of said passageways having an exit, opening into the outlet portion of said passage, that is of larger cross-sectional area than the cross-sectional area of the entrance of said passageway,

each of said passageways increasing in cross-sectional area from its entrance to its exit along a predetermined gradual gradient of increase of cross-sectional area for maintaining the velocity of the gas substantially constant during passage through each of said passageways.

5. A sound suppressing valve comprising:

a valve housing having an inlet and an outlet intercommunicated by a flow passage;

a stack of planar laminae, each of which comprises a thin flexible sheet that is formed with a plurality of individual lands on at least one surface thereof for abutment with a confronting surface of an adjacent one of said sheets, all of said sheets having some lands arranged for superimposition when said stack is under compression, the voids between said lands providing a plurality of rigidly inflexibly defined, clear unobstructed passageways through said stack between each adjacent pair of said sheets when said stack is held under compression imposed on said superimposed lands, each of said passageways being gradually divergent with an exit orifice, opening into the outlet portion of said flow passage, that is of larger cross-sectional area than the cross-sectional area of the inlet orifice of said passageway, each of said passageways increasing in cross-sectional area from its inlet to its exit along a predetermined gradual gradient of increase of cross-sectional area to maintain a substantially constant velocity during gas flow from the inlet to the exit of said passageway;

a means in said valve housing for supporting said stack, under compression, across an outlet portion of said flow passage whereby said stack is rigidified and defines a high density of inlet and outlet orifices of said flow passageways on opposite sides of said stack comprising the sum of the pluralities of said passageways defined between each pair of adjacent sheets in the compressed stack;

and a valve member having a surface of shape characteristics matingly complementary to that end of said compressed stack in which said inlet orifices of said passageways are defined, said valve member being mounted for movement in a direction to vary the number of said inlet orifices that are obstructed by said valve member.

3,917,223

SLIDE VALVE HAVING ADJUSTABLE PACKING

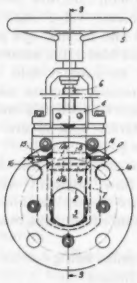
Hans Sidler, Blumenstein, and Hans Stalder, Vorhuben, both of Switzerland, assignors to Sistag, Maschinenfabrik Sidler Stalder AG, Switzerland

Filed July 24, 1972, Ser. No. 274,835

Claims priority, application Switzerland, Jan. 5, 1972, 106/72

Int. Cl. F16k *31/34*

U.S. Cl. 251—214 **7 Claims**



1. A slide valve comprising a valve housing having a transverse opening defining a flow passage, a slide valve inset housing movable back and forth to open and close said flow passage, a compressible packing means bearing at least against one face of said slide, and an adjustment member extending into said housing and bearing against said packing means and being adjustable to move said packing means to apply a predetermined pressure against said slide, said packing means including a hollow bar of elastomeric material which is divided in its central transverse plane to define a cavity, a compressible packing material in said cavity, said adjustment member being engageable with said compressible packing material, and a sealing pad disposed between said adjustment member and said compressible packing material, said hollow bars projecting beyond each end of said slide valve, said valve

comprising a flat plate, said hollow bars having a semicircular portion at each end, a similarly partly circular insert arranged between said bar semicircular end portions.

3,917,224

BOLT TIGHTENING APPARATUS

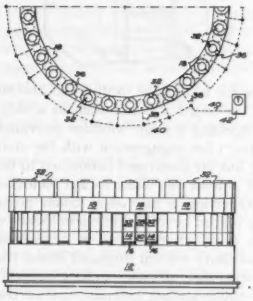
Fred Stansfield, Oldham, and Michael James Roe, Birmingham, both of Great Britain, assignors to Doncasters Moorside Limited, Oldham, England

Filed Apr. 30, 1974, Ser. No. 465,531

Claims priority, application United Kingdom, Feb. 18, 1974, 7194/74

Int. Cl.² E21B *19/00*

U.S. Cl. 254—29 A **3 Claims**



1. Apparatus for tensioning a plurality of screwthreaded fasteners, wherein the improvement comprises:

a. pairs of screwthreaded fasteners disposed in flanking relation to respective intermediary fasteners;

b. first means coacting with each one of said flanking fasteners for applying a tensile force to each flanking fastener;

c. a plurality of yoke members coacting with said first means and supported above said intermediary fasteners to exert tensile forces on pairs of fasteners flanking said intermediary fasteners;

d. second means for maintaining said yoke members in such coacting relation with said first means;

e. abutment means overlying respective intermediary fasteners and disposed to support said yoke members above said intermediary fasteners; and

f. third means coacting with said yoke members and with said abutments and creating forces in said yoke members that coact with said first means and thereby exert tensile forces in said flanking fasteners.

3,917,225

CARPET STRETCHER IMPROVEMENTS

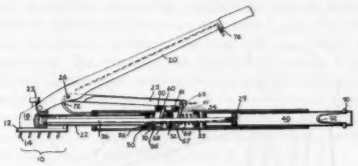
Buford L. Payson, Garden Grove, Calif., assignor to Robert E. Strauss, Orange, Calif.

Continuation of Ser. No. 291,799, Aug. 25, 1972, which is a continuation-in-part of Ser. Nos. 173,779, Aug. 23, 1971, Pat. No. 3,693,936, and Ser. No. 212,127, Dec. 27, 1971, Pat. No. 3,692,278. This application Aug. 29, 1974, Ser. No. 501,667

Int. Cl.² A47G *27/04*

U.S. Cl. 254—60 **15 Claims**

1. A carpet stretcher comprising: a head assembly bearing a plate having teeth for engagement of carpet and a rearwardly projecting head tube, a handle having one end thereof pivotally secured to a forward portion of said head assembly, a link member having one end pivotally secured to said handle at an intermediate point along the length thereof and its opposite end pivotally secured to a base tube assembly comprising a base tube, a receptacle tube concentrically carried at the forward end thereof and slidably receiving said head tube and terminating within said base tube with a bushing, and an extendible coupling assembly comprising a bar having its forward end telescopingly mounted within said receptacle and head tubes, lock means movable between lock and release positions carried by said base tube assembly and surrounding said bar of said coupling assembly, resilient means between said base tube and said lock means biasing said lock means into a locking position whereby said coupling assembly is



restrained from retraction in said base tube but is freely extendible therefrom, remote lock release comprising lever means pivotally carried on said bushing within said base tube and a cable extending from said lever means externally of said base tube, and attachment means carried at the free end of said coupling assembly for removable attachment of carpet stretcher accessories.

3,917,226

PORTABLE INDIVIDUAL WHEEL RAMPS

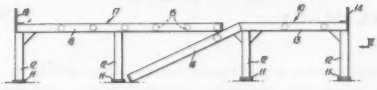
Raymond Greig Palmer, Linden House, Linden Road, Sunderland, England

Filed Oct. 9, 1973, Ser. No. 404,731

Claims priority, application United Kingdom, Oct. 6, 1972, 46251/72; May 11, 1973, 22503/73

Int. Cl.² E02C *3/00*

U.S. Cl. 254—88 **5 Claims**



1. A wheel ramp for supporting a single corner of a vehicle when raising the ground wheels of all four corners of a vehicle clear of a ground surface, such ramp having base means; riser track means; platform track means; and extension means adapted to be placed in position manually while a vehicle wheel is supported on said platform track means for optionally providing an extension of said platform track means above said riser track means; and means for locking said extension means in position above said riser track means to bear the load of a vehicle wheel driven thereonto from said platform track means, said extension means having a length at least as great as that of the platform track means.

3,917,227

VEHICLE RAMP

Roland J. West, Andover, Mass., assignor to Vaughn Corporation, Salisbury, Mass.

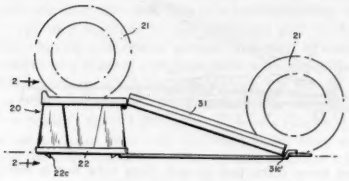
Filed July 16, 1973, Ser. No. 379,439

Int. Cl.² B66F *19/00*; **E02C** *3/00*

U.S. Cl. 254—88 **13 Claims**

1. A vehicle ramp which includes a pedestal and an incline supported at one end by the pedestal, said pedestal comprising a base member having raised side walls about the edge thereof, a pair of upright members positioned upon the base member and engaging along the bottom thereof the side walls of the base, each of said upright members having side wall edges, intermesh means provided at the side wall edges of each of the upright members which when urged together overlap to connect the upright members together, a top member positioned on top of the upright members and having side

wall means extending downwardly to engage the top side wall portions of said upright members, coupling means positioned between said top member and said bottom member to force and hold said top and bottom members against the upright members, means forming a part of said top member for supporting the incline, said base having at least one slot formed



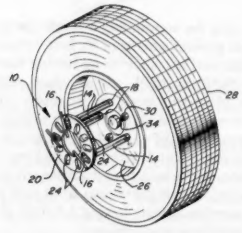
therein, said incline having at least one slot formed therein, at least one tie bar having two L shaped ends, said tie bar having its L shaped ends positioned in said slot of the base and said slot of the incline with the smaller portions of each L shaped end engaging a wall of the slots to prevent the incline from moving away from the pedestal.

3,917,228

METHOD OF FORMING A WINCH ASSEMBLY UPON A POWER-DRIVEN VEHICLE, AND SUCH ASSEMBLY

Julius A. Blum, 5450 Vale Drive, Denver, Colo. 80222

Filed Feb. 25, 1974, Ser. No. 446,035
Int. Cl.² B66D *3/00*
U.S. Cl. 254—166 **7 Claims**



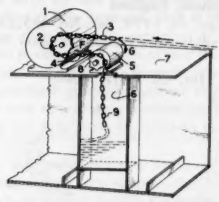
6. A winch assembly utilizing the wheel attachment means of a powered vehicle wheel as a part of the assembly, the assembly consisting essentially of: a plurality of bar members attached to the vehicle wheel at the wheel attachment means and extending axially therefrom, and at least one unitary, fixed dimension support means having spaced openings larger than the diameter of the bar members defined therein positioned between the bar members at a portion of the bar members spaced from the wheel with the bar members loosely positioned in the openings in the support means, whereby anchored cable means may be wound directly upon the bar members forming the reel upon rotation of the wheel thereby concurrently producing a tension in the cable means and compressing the bar members around the support means to secure the support means within the bar members.

3,917,229

DEVICE FOR HEAVING IN, LETTING OUT AND STORING A CHAIN

Gerard Ayme, 5, rue Henri Guichard, 44,000 Nantes, France

Filed Dec. 6, 1973, Ser. No. 422,140
Claims priority, application France, Dec. 7, 1972, 72.44085
Int. Cl.² B66D *1/76*
U.S. Cl. 254—175.5 **13 Claims**



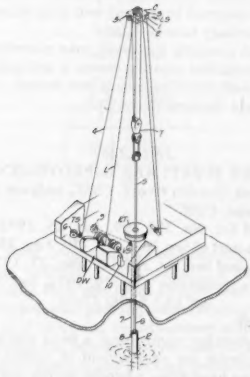
1. A device for heaving in, letting out and storing a chain, in particular on board a vessel such as a ship or a floating platform, comprising a main windlass provided with at least one main wildcat for engagement with the chain for heaving in and letting out the chain and connected to be driven by the windlass, and at least one chain locker located near the main wildcat for receiving a heaved-in chain portion, the main wildcat being placed beyond said chain locker with respect to the direction in which the chain is heaved in by the main wildcat, an auxiliary wildcat disposed above the chain locker for engagement with an intermediate section of the chain which intermediate section extends between the main wildcat and the chain locker, and a torque motor drivingly connected to the auxiliary wildcat for imparting to said intermediate chain section a constant tension irrespective of the direction of rotation of the main wildcat.

3,917,230

WELL DRILLING CONTROL SYSTEM

Charles D. Barron, Fountain Valley, Calif., assignor to Byron Jackson Inc., Long Beach, Calif.

Filed Jan. 24, 1972, Ser. No. 220,284
Int. Cl.² B66D *1/48*
U.S. Cl. 254—173 R **18 Claims**



1. In apparatus for supporting and moving well equipment from a floating vessel relative to the well, a drawworks including a fast line drum for taking up and playing out a load supporting line, first slipping drive means of variable torque capacity for driving said drum in a direction to wind the line thereon, said first slipping drive means including an unidirectional source of power and adjustable torque capacity contin-

uously slipping drum clutch means interposed between said source of power and said drum, the line being unwound from said drum when the tension in the line produces countertorque in said slipping drum clutch means that exceeds its momentary torque capacity, additional reverse drive means, including adjustable torque capacity continuously slipping reverse clutch means, for driving said drum in a direction to play out the line therefrom, and control means for increasing the torque capacity of said slipping reverse clutch means when the torque capacity of said first slipping drum clutch means is reduced, said first slipping drive means including a source of power and adjustable torque capacity slipping drive clutch means interposed between said source of power and said drum, and said additional reverse drive means including adjustable torque capacity slipping reverse clutch means, and control means for increasing the torque capacity of said reverse slipping clutch means when the torque capacity of said slipping drum clutch means is reduced, said control means including sensing means responsive to movement of said equipment relative to said vessel, sensing means responsive to movement of said vessel relative to the well, and means operable by said sensing means to oppositely adjust the torque capacity of said drum clutch means and said reverse clutch means.

6. In apparatus for supporting and moving well equipment from a floating vessel relative to the well, a drawworks including a fast line drum for taking up and playing out a load supporting line, first slipping drive means of variable torque capacity for driving said drum in a direction to wind the line thereon, said first slipping drive means including a unidirectional source of power and adjustable torque capacity continuously slipping drum clutch means interposed between said source of power and said drum, the line being unwound from said drum when the tension in the line produces countertorque in said slipping drum clutch means that exceeds its momentary torque capacity, additional reverse drive means, including adjustable torque capacity continuously slipping reverse clutch means, for driving said drum in a direction to play out the line therefrom, and control means for increasing the torque capacity of said slipping reverse clutch means when the torque capacity of said first slipping drum clutch means is reduced, said control means increasing the torque capacity of said additional slipping drive means and decreasing the torque capacity of said first slipping drive means when the vessel moves upwardly relative to the well and decreasing the torque capacity of said additional slipping drive means and increasing the torque capacity of said first slipping drive means when the vessel moves downwardly relative to the well, said control means including load sensing means operable in response to the weight of the load to produce a load control signal, means responsive to changes in said load control signal to produce a control signal, and means responsive to said control signals for increasing and decreasing the torque capacity of said slipping drive means as aforesaid.

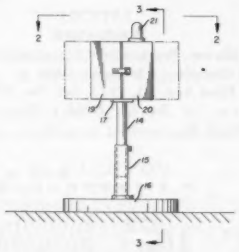
14. In apparatus for supporting and moving well equipment from a floating vessel relative to the well, a drawworks including a fast line drum for taking up and playing out a load supporting line, first slipping drive means of variable torque capacity for driving said drum in a direction to wind the line thereon, said first slipping drive means including a unidirectional source of power and adjustable torque capacity continuously slipping drum clutch means interposed between said source of power and said drum, the line being unwound form said drum when the tension in the line produces countertorque in said slipping drum clutch means that exceeds its momentary torque capacity, additional reverse drive means, including adjustable torque capacity continuously slipping reverse clutch means, for driving said drum in a direction to play out the line therefrom, and control means for increasing the torque capacity of said slipping reverse clutch means when the torque capacity of said first slipping drum clutch means is reduced, said control means increasing the torque capacity of said additional slipping drive means and decreasing the torque capacity of said first slipping drive means when the vessel moves upwardly relative to the well and decreasing the torque capacity of said additional slipping drive means and increasing the torque capacity of said first slipping drive means when the vessel moves downwardly relative to the well, said slipping drive means comprising slip clutches having actuator means variable by said control means for increasing and decreasing the torque capacity of said slip clutches, said control means including vessel position sensing means and load position sensing means for producing position air signals determined by relative movement between the vessel and the well and relative movement between the load and the vessel, means responsive to said position air signals to produce a position control air signal, load sensing means operable in response to the weight of the load to produce a load control air signal, and means responsive to said control air signals for increasing and decreasing the air supplied to said actuator means to vary the torque capacity of said slip cluthes as aforesaid.

3,917,231

FLEXIBLE TRAFFIC BARRIER

Robert Fink, Youngstown, Ohio, assignor to Inglis Nurseries Inc., Youngstown, Ohio

Filed Apr. 1, 1974, Ser. No. 457,073
Int. Cl.[2] E01F *13/00*
U.S. Cl. 256—64 **1 Claim**



1. A flexible traffic barrier comprising a yoke, a hand grip on said yoke, a reel journeled in said yoke, an elongated strip of flexible cloth-like material having highly visible contrasting markings thereon attached at one of its ends to said reel and wound thereon, a spring urged latch on said yoke adjacent said reel, said latch positioned for registry with an aperture in said reel, an apertured fitting on the free end of the strip of flexible material arranged to attach said free end to an object so as to maintain the strip of flexible material in stretched on edge position relative to said reel when said spring urged latch is engaged in said aperture in said reel and a crank on said reel for rotating the same in rewinding said elongated strip of cloth-like material thereon, said spring urged latch being movable from a first position engaging said aperture in said reel to a second position disengaging said aperture in said reel.

3,917,232

TRAFFIC BARRICADE

Henry Linder, Wood Dale, Ill., assignor to Beatrice Foods Co., Chicago, Ill.

Filed Apr. 25, 1974, Ser. No. 463,914
Int. Cl.[2] E01F *13/00*
U.S. Cl. 256—64 **11 Claims**

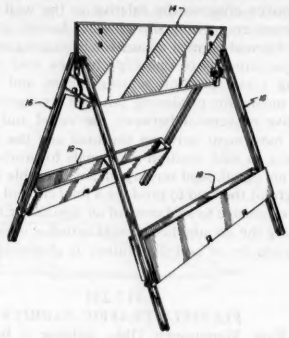
1. In a barricade having a warning panel supported by opposite spaced pairs of aligned legs pivotally mounted at opposite sides of said panel,

a demountable elongated box extending to spaced aligned legs on each face side of the panel, said box having means to receive weighted material to anchor the barricade in erected position,

each of said spaced aligned legs being identically molded,

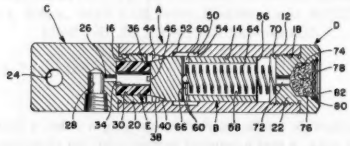
a leg interlock means on each of said spaced aligned legs, integrally formed box interlock means at each of the

opposite ends of said box engageable with said leg interlock means, and



position means on each of the legs to fix each box along the length of the spaced aligned legs.

3,917,233
VIBRATOR
Warren A. Blower, Brecksville, Ohio, assignor to The Sherwin-Williams Company, Cleveland, Ohio
Filed Aug. 24, 1973, Ser. No. 391,236
Int. Cl.[2] B06B *1/18*
U.S. Cl. 259—1 R **11 Claims**



1. A pneumatic vibrator including a part having a bore therein, a plunger reciprocatingly positioned in said bore for movement between striking and exhaust positions, air inlet and exhaust ports communicating with said bore on opposite sides of said plunger, exhaust passage means through said plunger for exhausting air from said inlet port to said exhaust port in said exhaust position thereof, opposite end caps closing said bore, said inlet port being in one of said end caps and said exhaust port being in the other of said end caps, said bore having a longitudinal axis and said inlet and exhaust ports being substantially coincidental with said axis, a striker insert of low sound transmitting material adjacent said inlet port, and inlet passage means for passing air from said inlet port to said bore in contact with said insert for cooling said insert.

3,917,234
BEVERAGE STIRRER
Robert R. Brown, Jr., Fairbanks, Alaska, assignor to The Raymond Lee Organization, Inc., a part interest
Filed June 24, 1974, Ser. No. 482,014
Int. Cl.[2] B01F *13/02*
U.S. Cl. 259—1 R **2 Claims**

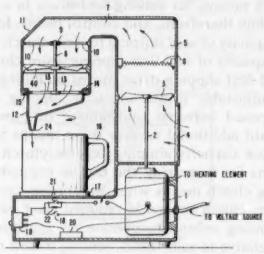
1. A device for stirring beverage in a cup, said device comprising:

a horizontal platform supporting said cup;

a pressure sensitive switch disposed below the platform, said switch being closed when the cup rests on the platform and being open when the cup is removed from the platform;

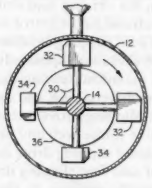
first means including an electrically energized heating coil connected in circuit with said switch to produce a pressurized heated stream of air when the switch is closed; and

second means responsive to said stream to direct said stream downwardly into said cup when it is in place on



the platform, said second means including a vertically disposed nozzle rotatable about a vertical axis offset from the axis of the nozzle and continuously changing the direction of said stream while said stream is directed downwardly into the cup.

3,917,235
MIXING APPARATUS
Vagn Deve, East Washington, Pa., assignor to Combustion Engineering, Inc., Windsor, Conn.
Filed Apr. 26, 1974, Ser. No. 464,585
Int. Cl.[2] B01F *7/04, 7/10*
U.S. Cl. 259—9 **3 Claims**



1. Mixing apparatus including a cylindrical housing having a horizontal axis, an axial, longitudinal shaft extending from one end of the housing to the other end, means for rotating the shaft, inlet means for introducing materials to be mixed into the housing at one end, outlet means through which mixed material can be discharged from the other end of the housing, a plurality of paddle means extending radially from the shaft, each paddle means consisting of a radial rod secured at its inner end to the shaft, and having a blade secured to its outer end, all of said blades being secured to the rods at an angle of inclination to a plane transverse to the axis of the cylinder such that they move the materials to be mixed together from the inlet end to the outlet end of the housing, the blades being positioned such that there is a pair of diametrically opposed blades at each longitudinal location, one of each pair of diametrically opposed blades at each longitudinal location extending in a radial direction so that its outer extremity is in close proximity to the inner wall of the cylindrical housing, while the other of each pair of the diametrically opposed blades at each longitudinal location has an outer extremity somewhat spaced from the inner wall of the cylindrical housing, so that the materials are constantly and intermittently exposed to shearing, intermixing forces as they helically travel the length of the housing, and imperforate circular baffle means secured to the shaft and extending radially to a point closely adjacent the inner extremities of the blades, said baffle

means being located longitudinally at a point downstream of and adjacent to the inlet means.

3,917,236

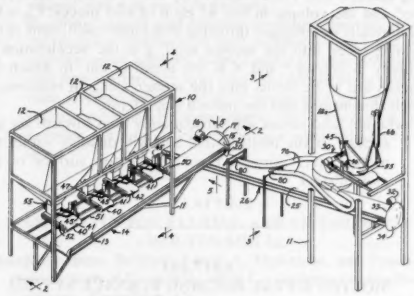
CONCRETE MIXING PLANT

Raymond A. Hanson, P.O. Box 7400, Spokane, Wash. 99207

Filed Mar. 4, 1974, Ser. No. 447,663

Int. Cl.² B28C *5/02*

U.S. Cl. 259—154 **8 Claims**



1. In a concrete mixing plant:

a framework;

supply means mounted on said framework for discharging quantities of individual concrete components at controlled delivery rates at individual outlets arranged along the framework in a straight path;

an endless belt conveyor mounted on said framework, said endless belt conveyor having an upwardly-facing surface arranged along said path beneath said outlet, whereby concrete components may be delivered from said outlets onto the upwardly facing surface of the conveyor, the upwardly facing surface being terminated at a discharge point at one end of the conveyor;

an upright abutment surface fixed to said framework and arranged along said path outwardly from said one end of the conveyor, said upright abutment surface having a width and elevation encompassing the width and elevation, respectively, of said upwardly facing surface;

and power means on said framework operatively connected to said conveyor for imparting velocity to said moving surface in a direction leading toward said one end of the conveyor at a rate such that mixing of the concrete components will occur on the conveyor and the concrete components will be propelled from said one end of the conveyor to impact the upright abutment surface.

3,917,237

METHOD AND APPARATUS FOR CONTROLLING CONTINUOUS THROUGH-PUT OF MATERIAL ON MIXING ROLLS OF A MILL

Gottfried Sander, Richterich, Germany, assignor to Hermann Berstorff Maschinebau GmbH, Hannover-Kleefeld, Germany

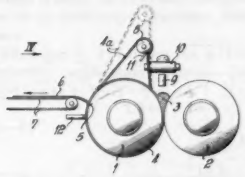
Filed Dec. 10, 1973, Ser. No. 423,481

Claims priority, application Germany, Dec. 11, 1972, 2260565

Int. Cl.² A21C *1/08*

U.S. Cl. 259—188 **3 Claims**

1. Apparatus for controlling continuous through-put of material on mixing rolls of a mill comprising a material store in the form of a store roll, steplessly adjustable in height above the rolls of the mill, to receive at least a portion of a sheet of material freed from a sheet-carrying roll of the rolls of the mill and to feed it back to the gap between the rolls, sensing means for sensing the size of a knead of material in the gap between the rolls, said sensing means comprising an ultrasonic device to sense the level of the knead and, in accordance with such level, to transmit pulses to a control device which acts on an adjusting motor of an adjusting mechanism, such mechanism including rotating spindles which act on the shaft of the store roll and steplessly adjust the spacing of the store roll from the rolls of the mill such that when a knead of material in the gap



between the rolls becomes smaller than a desired size the store roll is moved towards the rolls of the mill so that more material per unit of time is fed to the gap, and when the knead becomes larger than a desired size the store roll is moved away from the rolls of the mill so that less material per unit of time is fed to the gap.

3,917,238

OVEN APPARATUS

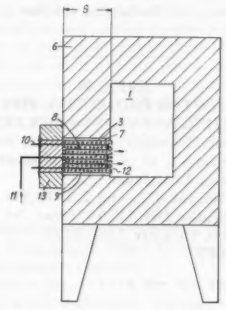
Werner Gohring, 40 Materborner Allee, D-419 Kleve, Germany

Filed Sept. 13, 1973, Ser. No. 397,164

Claims priority, application Switzerland, Sept. 16, 1972, 13535/72

Int. Cl.² C21D *1/74*

U.S. Cl. 266—5 E **1 Claim**



1. Apparatus for the heat treatment of metal workpieces in a controlled atmosphere, comprising:

i. a furnace chamber to receive workpieces;

ii. a heat-insulating wall surrounding said furnace chamber, said wall having an opening therein extending all the way through said wall from the inside of the chamber to the outside of the wall;

iii. a catalyst bed disposed in said opening of said wall and extending from the inside line of the furnace wall to the outside line of the furnace wall and substantially filling the opening;

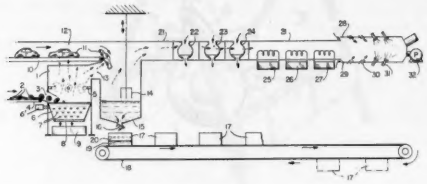
iv. electric heating elements disposed within said catalyst bed, said elements being pipes of which the outer surface is in contact with catalyst and of which the inner surface is open to the external atmosphere; and

v. means for introducing a fuel into said catalyst bed for passage therethrough into said furnace chamber.

3,917,239
VEHICLE RECYCLING PLANT

Paul E. Rhinehart, P.O. Box 184, Mountain Falls Rte., Winchester, Va. 22601

Filed June 11, 1974, Ser. No. 478,377
Int. Cl.[2] C21C 7/00
U.S. Cl. 266—16 **16 Claims**

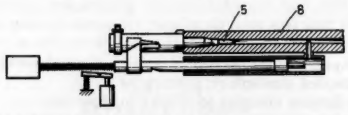


1. A vehicle recycling plant comprising a furnace, means for introducing a fuel into said furnace, a cupola disposed in close proximity to said furnace, and communicating therewith so that the hot gases discharged from the furnace are introduced into the cupola, means for conveying scrap vehicles above said furnace and into said cupola, substantially horizontal flue means communicating with both the cupola and the furnace for removing exhaust gases therefrom, a plurality of smelters disposed in said horizontal flue for melting down various components previously disassembled from the vehicles, a plurality of heat exchange means disposed in said horizontal flue for removing heat therefrom and converting it into various forms of energy, an enlarged horizontal flue portion disposed downstream of said heat exchange means, said enlarged flue portion containing a plurality of air vents for mixing ambient air with the flue gas and a scrubbing section for removing particulate material from the flue gas, vacuum pump means for drawing the flue gas through the horizontal stack and exhaust means for discharging the flue gas to the atmosphere.

3,917,240
APPARATUS FOR PROJECTING PIECES OF A DEOXIDIZING AGENT INTO MOLTEN STEEL

Toyosuke Tanoue, Toyonaka; Taiji Araki, and Takeo Aoki, both of Nishinomiya, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Japan

Division of Ser. No. 168,072, Aug. 2, 1971, Pat. No. 3,837,842. This application Oct. 17, 1973, Ser. No. 407,043
Int. Cl. C21c 7/00; B22d 27/00
U.S. Cl. 266—34 T **4 Claims**



1. An apparatus for continuously projecting pieces of a deoxidizing agent into molten steel, comprising:

projection means for projecting said pieces into the molten steel in a direction substantially perpendicular to the upper surface of the molten steel at an initial velocity selected such that said pieces descend to a predetermined depth within the molten steel.

means for feeding said pieces to said projection means; and

means for adjusting said projection means so that the initial velocity at which said pieces are projected is defined by the following relationship

$$u_o = K \sqrt{\frac{2(\rho f - \rho s)\, V \cdot g}{\rho s \cdot C_D \cdot S}} \tan.\cos^{-1} \exp\left(-1/2 \cdot \frac{\rho f}{\rho s} \cdot \frac{S}{V} \cdot C_D X\right)$$

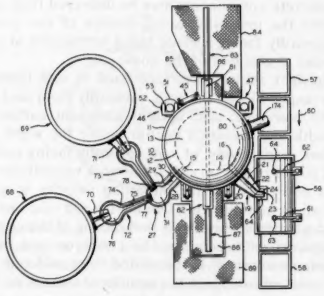
wherein u_o is the initial projection velocity of the piece in cm./sec., k is an empirically determined velocity loss coefficient representative of the velocity losses occasioned by air resistance and surface impact, ρf and ρs are respectively the densities in g./cm^3. of the molten steel and pieces of deoxidizing agent, S and V are respectively the cross-sectional area in cm^2 and the volume in cm^3 of each of said pieces, C_D is the empirically determined thrusting resistance coefficient of the adding piece into the molten steel, g is the acceleration of gravity in cm/sec.^{2} and X is the depth in cm. to which the pieces are to be thrust into the molten steel, in response to their dimensions and the molten steel depth;

whereby said pieces will subsequently float towards the top surface of the molten steel and will dissolve within the molten steel prior to reaching the top surface of the molten steel.

3,917,241
MOLTEN METAL HOLDING FURNACE SYSTEM

Theodore J. Steffora, Allison Park, and Eberhard G. Schempp, Pittsburgh, both of Pa., assignors to Lectromelt Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 323,733, Jan. 5, 1975, abandoned, which is a division of Ser. No. 185,633, Oct. 1, 1971, Pat. No. 3,737,153. This application May 7, 1974, Ser. No. 467,815
Int. Cl.[2] C21C 7/00
U.S. Cl. 266—34 PP **12 Claims**



1. A holding furnace comprising:

a. an enclosed refractory lined vessel,

b. said vessel having spaced apart orifices extending therethrough, and below the normally expected level of molten metal to be contained in said furnace,

c. molten metal receiving spout means mounted on said vessel in communication with one orifice and a pouring spout means mounted on said vessel is communication with another orifice,

d. said receiving spout means and said pouring spout means extending upwardly from said orifices so that their metal receiving and pouring openings are above the normally expected level of molten metal in said vessel,

e. means supporting said vessel for tilting on an axis,

f. means operable to tilt said vessel selectively on said axis,

g. means for receiving a quantity of molten metal from said vessel, said receiving means being movable with respect to said vessel and being arranged to be positioned

beneath the pouring spout when said vessel is in a tilted position, and

h. weight responsive means positioned to be engaged by said receiving means when the latter is beneath said pouring spout, means for initiating the tilting of said vessel to pour molten metal into said receiving means, said responsive means being operative to produce a signal functionally related to said weight, and contol means responsive to said signal for controlling said tilt means to terminate said pouring after a preselected quantity of metal has been poured into said receiving means,

i. the tilting axis of said furnace extending through at least the terminal portions of said receiving spout and said pouring spout whereby molten metal may be admitted to said furnace through said receiving spout when said furnace is tilted for discharge of metal into said receiving means and whereby atmospheric air is prevented from entering the interior of said furnace when said furnace is tilted.

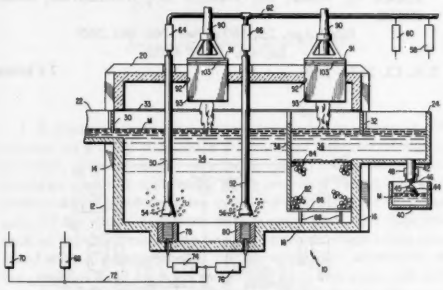
3,917,242
APPARATUS FOR FLUXING AND FILTERING OF MOLTEN METAL

Joseph A. Bass, Bremen; Lewis A. McKenzie, and Frank M. Powers, both of Carrollton, all of Ga., assignors to Southwire Company, Carrollton, Ga.

Continuation-in-part of Ser. No. 361,589, May 18, 1973. This application May 15, 1974, Ser. No. 470,028

Int. Cl.[2] C21C 7/04

U.S. Cl. 266—34 R **23 Claims**



1. A two-stage tandem apparatus for continuously treating molten metal to substantially remove gas and finely-divided solids therefrom, comprising a treating chamber having side walls and a floor, a refractory weir dividing said chamber into first and second sections, said weir extending vertically and being spaced from said floor for providing communication between said first and second sections, means for introducing a fluxing gas into said first section for fluxing gas from molten metal contained therein, a filtering medium disposed in said second section for filtering finely-divided solids from molten metal passed upwardly therethrough, a removable lid having sealing means associated therewith disposed over said chamber for preventing the infusion of air and moisture from the surrounding atmosphere and for providing a protective atmosphere over molten metal contained therein, burner means mounted on said lid and communicating with the interior of said chamber through at least one opening extending therethrough for providing heat to the molten metal, means for closing said at least one opening when said burner means are not in use whereby said protective atmosphere may be maintained, said burner means being mounted in at least one burnerblock assembly mounted in said at least one opening, said at least one burnerblock assembly including a refractory burner block extending into said chamber and having an axial bore extending therethrough and communicating with the atmosphere during operation to provide secondary air for supporting combustion, and wherein said means for closing said at least one opening includes damper means for closing said axial bore thereby preventing said communication.

3,917,243
SUPERSONIC SHOCK WAVE TUYERE

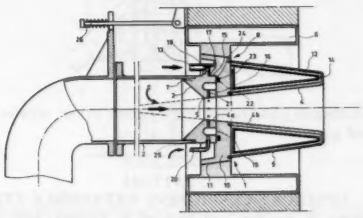
Daniel Borgnat; Guy Forestier, both of Semmecourt, and Georges Rupp, Woippy, all of France, assignors to Institut de Recherches de la Siderurgie Francaise, Saint-Germain-en-Laye, France

Filed Jan. 9, 1974, Ser. No. 431,964

Claims priority, application France, Jan. 18, 1973, 73.01692

Int. Cl.[2] C21B 7/16

U.S. Cl. 266—41 **9 Claims**



1. A supersonic shock wave tuyere for injecting a mixture of fuel and a combustion-supporting medium into a shaft furnace, said tuyere having an unobstructed passage including a convergent portion and a divergent portion with a sonic throat at the junction of said portions, said tuyere comprising a first member forming said convergent portion, said sonic throat and a first part of said divergent portion; a fixed, hollow internally cooled second member forming a second part of said divergent portion; and means for removably connecting said first member to said second member so that said first and second parts of said divergent portion are joined to form extensions of each other whereby upon change of the rate of the supply medium for support of combustion, said first member may be exchanged for a different first member having a different throat area and adapted to be placed against the original second member to modify the sonic throat as a function of said change.

3,917,244
LOAD-BEARING COMPRESSION LEG

Carl Ullrich Peddinghaus, Obere Lichtenplatzer Strasse 276, Wuppertal-Barmen, Germany

Filed Aug. 1, 1974, Ser. No. 493,859

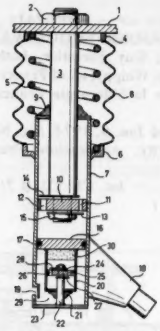
Claims priority, application Germany, Mar. 8, 1973, 2339355

Int. Cl.[2] B60G 11/56

U.S. Cl. 267—34 **5 Claims**

1. A load-bearing compression leg, including a spring, a hydraulic first vibration damper which is fitted in the direction of operation of the spring and has a cylinder in which a damping piston fixed to a piston rod can move and in which there is an equalisation space for the damping fluid displaced by the piston rod, a displaceable sealing separating piston separating said equalisation space from a further space in which is received a hydro-pneumatic vibration damper, said hydro-pneumatic vibration damper being of smaller dimension than the first vibration damper and having a piston rod of smaller diameter than said piston rod of said first vibration damper, and said hydro-pneumatic vibration damper at one end engaging the surface of said separating piston remote from the equalisation space, the other end of said hydro-pneumatic vibration damper being secured to the base of the cylinder of the first vibration damper, the stroke of said hydro-pneumatic

vibration damper being of the same length as that of the separating piston, and said hydro-pneumatic vibration damper



including an equalisation space which, in use, receives pressurised gas.

3,917,245

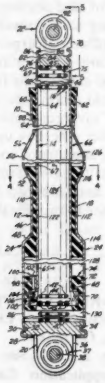
UPSTROKE-CUSHIONING EXPANSIBLE STRUT

Werner H. Fengler, and Richard R. Fengler, both of 23651 Fordson Drive, Dearborn, Mich. 48124

Continuation of Ser. No. 304,853, Nov. 8, 1972, abandoned. This application June 3, 1974, Ser. No. 475,505

Int. Cl.[2] F16F 5/00

U.S. Cl. 267—120 9 Claims



1. An upstroke-cushioning expansible strut adapted bo be pivotally connected between an upwardly-swingable closure structure and an enclosed structure to which the closure structure is hingedly attached, said expansible strut comprising

an elongated tubular outer arm having a closed end and an open end and an outer spring abutment disposed remote from said open end and having a pivotal connector disposed adjacent said closed end and adapted to be pivotally connected to one of said structures,

an elongated tubular inner arm disposed in telescoping relationship to said outer arm for relative reciprocation therebetween and having a closed end and an inner spring abutment disposed remote from the closed end of said outer arm and also having a pivotal connector disposed adjacent said closed end of said inner arm and adapted to be pivotally connected to the other of said structures,

elongated counterbalancing spring means disposed between and in substantially continuous engagement with said outer and inner spring abutments and normally urging said arms away from one another and adapted to counterbalance the weight of the closure structure,

an outer sealing element disposed between the open end of said outer arm and said inner arm in sealing engagement with said inner arm during relative sliding motion therebetween,

said outer arm having a longitudinal bore and a pneumatic cushioning chamber with a normally-open air outlet therefrom and said inner arm having piston means thereon disposed in relative sliding engagement with said bore and movable toward and away from said cushioning chamber,

means responsive to a predetermined relative travel of said arms away from one another for closing said outlet and for consequently causing said piston means to compress the thus-entrapped air in said cushioning chamber to cushioningly halt the remaining relative travel of said arms away from one another subsequent to said closing of said outlet,

and unidirectional-flow valve means responsive to relative motion of said arms away from one another to prevent air flow between opposite sides of said piston means and responsive to relative motion of said arms toward one another to permit such air flow between opposite sides of said piston means.

3,917,246

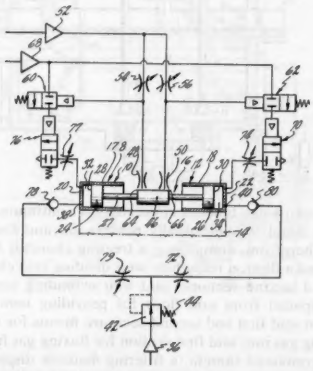
TUNABLE VIBRATION ABSORBER

Joseph R. Gartner, 147 Davis Road, Storrs, Conn. 06268, and Harold M. Miller, 210 Fletcher St., Whittinsville, Mass. 01588

Filed Apr. 15, 1974, Ser. No. 461,265

Int. Cl.[2] F16F 9/02

U.S. Cl. 267—136 7 Claims



1. A vibration absorber for attachment to a vibrating mass comprising:

housing means;

inertia mass means adapted to naturally reciprocate in response to vibrations of the vibrating mass, said inertia mass means comprising oppositely facing first and second piston faces disposed within said housing means along a common axis, said faces defining in combination with said housing means a first and a second pressurizable chamber each being independent of the other, said inertia mass means also including connecting means rigidly joining said piston faces;

pressure regulating means associated with said chambers for maintaining substantially equal minimum pressures therewithin;

control means associated with said pressure regulating means for setting the proper pressure in said chambers to

cause said inertia mass means to naturally reciprocate with substantially the same period as the vibrations of the vibrating mass; and

adjusting means associated with said inertia mass means causing adjustment in the position of said inertia mass means to maintain approximately symmetric restoring forces on said first and second piston faces during reciprocating motion of said inertia mass means.

3,917,247

FENDER

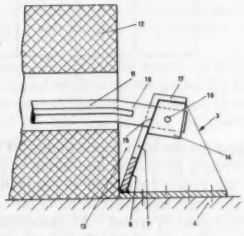
Hendrikus Kramer, Puccinidreef, Netherlands, assignor to International B. F. Goodrich-Europe B.V., The Hague, Netherlands

Filed Sept. 11, 1973, Ser. No. 396,305

Claims priority, application Netherlands, Sept. 20, 1972, 7212739

Int. Cl.² E02B *3/22*

U.S. Cl. 267—140 **4 Claims**



1. A fender comprising a suspension structure adapted to be secured to a quay wall and a thick-walled cylinder of elastic material, such as rubber, synthetic rubber and other elastic synthetic material, said fender being provided with at least one shaft and two rigid consoles provided with slots for opposite ends of the shaft, said slots having open ends, the opposite ends of the shaft extending beyond said open slots being provided with abutment means co-operating with abutments of the consoles, said consoles projecting from the quay wall and being provided with means adapted to be secured to said quay wall, each of the consoles of the suspension structure having a side facing an adjacent end face of the cylinder and forming an angle with the adjacent end face of the cylinder in an unloaded condition of said cylinder.

3,917,248

PNEUMATIC HOLDING OR CLAMPING DEVICE

Max Mayer, 7914 Pfuhl 2 (Burlafingen), Germany

Filed May 20, 1974, Ser. No. 471,581

Claims priority, application Germany, May 30, 1973, 2327753

Int. Cl.² B25B *1/18;* **F01B** *15/02*

U.S. Cl. 269—23 **7 Claims**

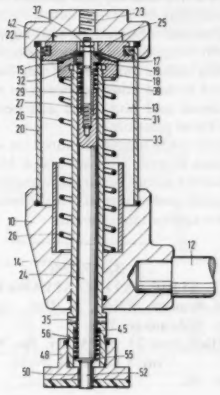
1. A pneumatic holding device for workpieces, comprising: a first holding cylinder of narrower cross-section; a first chamber defined in and by said first cylinder; a vent from said first chamber;

a second cylinder of larger cross-section; a first piston sealingly located in and movable along and through said second cylinder; said first piston dividing said second cylinder into second and third chambers;

a first conduit across said first piston and communicating between said first and said second chambers; a second conduit across said first piston and communicating between said second and said third chambers;

a fluid inlet to said third chamber;

a valve movable for selectively opening one of said first and second conduits while closing the other of said first and second conduits, and vice versa;



an abutment sensor extending out of said pneumatic holding device and being connected with said valve for causing the aforesaid movement thereof, in a manner such that application of pressure to said abutment sensor shifts said valve to close said second conduit.

3,917,249

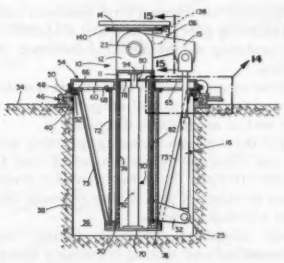
WORKPIECE ORIENTATION COLUMN

Henry G. Constantine, New Orleans, La., assignor to Avondale Shipyards, Inc., Avondale, La.

Continuation-in-part of Ser. No. 152,816, June 14, 1971, abandoned. This application Aug. 20, 1973, Ser. No. 389,446

Int. Cl.² B23Q *3/04*

U.S. Cl. 269—58 **17 Claims**



1. Apparatus for orienting and positioning a large, complex shaped workpiece for machining by movement with respect to five axes, comprising:

a. At least one horizontally extending fixed track;

b. Table means mounted on said track;

c. First drive means drivingly interconnecting said table means and said track for back and forth movement of said table means;

d. Platform means rotatably mounted on said table mekans and defining a vertically extending aperture therethrough;

e. Second drive means rotatably interconnecting said table means and platform means;

f. A vertically extending support column having a vertical axis and extending through said aperture;

g. Means mounting said support column for rotation with said platform means;

h. Elevating means rigidly mounted to and extending beneath said platform means and fastened to said column to raise and lower said support column with respect to said platform means;

i. Housing means mounted on said support column above said platform means for rotation about an horizontal axis;

j. Rotating means mounted on said support column and connected to said housing means to rotate said housing means about said horizontal axis between a horizontal and a vertical position;

k. Workpiece table means mounted on said housing means for rotation thereon through about 360°; and

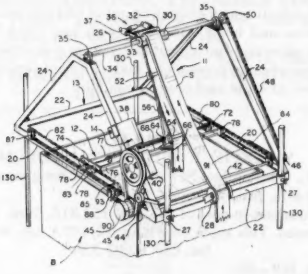
l. Third drive means drivingly interconnecting said housing means and workpiece table means for rotation of said workpiece table means.

3,917,250

STRIP LAYING APPARATUS

Charles Earl Branick, Fargo, N. Dak., assignor to Applied Power Inc., Milwaukee, Wis.

Filed June 21, 1973, Ser. No. 372,196
Int. Cl.[2] B65H *29/46*
U.S. Cl. 270—30 **14 Claims**



1. Apparatus for laying a strip material, including support means extending generally in a first direction,

first translating means movably mounted on said support means,

first drive means coupled to said first translating means for moving the same on said support means in said first direction and in an opposite direction,

said first drive means including reversing means for reversing the direction of movement of said first translating means after the latter has moved a predetermined distance in either of said first or opposite directions,

second translating means,

material discharge means including directing means mounted on said second translating means for directing said material,

second drive means mounted on said first translating means and coupled to said second translating means for moving the same in a direction generally normal to said first direction, said second drive means being normally inactive and being coupled to said first drive means and being operative to step said second translating means an incremental distance in said generally normal direction each time said reversing means reverses the direction of travel of said first translating means, said second drive means being inactive between reversals of said first translating means,

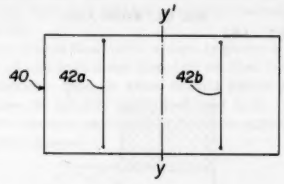
said material discharge means including drive roller means for engaging said strip material and for feeding the same to said directing means, said drive roller means being mounted for rotation on said support means about an axis generally parallel to said generally normal direction and spaced from said directing means, and including means for adjusting the relative speeds of said drive roller means and said first drive means to adjust the speed of said material relative to that of said first translating means to thereby adjust the length of material laid for each direction reversal of said frist translating means.

3,917,251

METHOD FOR THE HIGH SPEED FOLDING OF SHEET PAPER

Stephen W. De Lise, West Islip, and Frank C. De Lise, Nissequogue, both of N.Y., assignors to S & F DeLise Realty Corporation, Lynbrook, N.Y.

Filed Jan. 25, 1974, Ser. No. 436,716
Int. Cl.[2] B41L *43/12*
U.S. Cl. 270—37 **3 Claims**



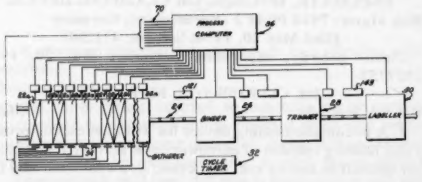
1. A method for the high speed folding of individual sheets of paper traveling in a direction along a conveying means comprising the ordered steps of (1) applying adhesive to a surface of each sheet along one or more off-center lines parallel to said direction of travel, (2) immediately folding each sheet upon itself along a first fold line parallel to and not coinciding with any of said lines of adhesive to cause the line or lines of adhesive on a portion of said surface on one side of said fold line to adhere to a portion of said same surface on the other side of said fold line, (3) folding each folded sheet one or more times upon itself parallel to and coinciding with each of said lines of adhesive and said first fold line and triming the first fold of said sheets to produce multi-page signatures.

3,917,252

METHOD AND APPARATUS FOR PRODUCING MAGAZINES OR THE LIKE

Donald C. Harder, Cleveland, Ohio, and Victoriano F. Rana, Easton, Pa., assignors to Harris-Intertype Corporation, Cleveland, Ohio

Filed May 7, 1971, Ser. No. 141,331
Int. Cl. B65h *39/02*
U.S. Cl. 270—58 **19 Claims**



1. A method for producing different magazines, composed of different predetermined combinations of signatures, for different subscribers classified in different geographic groups by region and different sub-groups within each group by demographic characteristics in accordance with predetermined criteria from known subscriber information which includes for each subscriber his name and address and at least one item of demographic information, utilizing different sets of signatures

located in different pockets of a gathering machine of the type in which each cycle of the gathering machine causes successive feeding of signatures from at least some of the pockets to make up each magazine and in which each pocket may be individually instructed to feed or not feed during each gathering cycle, the method comprising the steps of:

preparing a machine readable file identifying each subgroup in each different group with; (1) the corresponding number of subscribers within the subgroup, and (2) a predetermined combination of at least some of the gatherer pockets to be instructed to feed during a gathering machine cycle to provide the predetermined combination of signatures constituting the appropriate magazine for that subgroup,

preparing a preprinted stock of subscriber names and address labels arranged by group and subgroup in the same order as the groups and subgroups are arranged in the file,

progressively machine reading the file in timed relation to the cycles of operation of the gathering machine, in accordance with the reading of the file, instructing feeding of the gatherer pockets in the predetermined combinations to produce, for each subgroup, a number of magazines of the appropriate predetermined signature combination equal to the number of subscribers in that subgroup,

feeding the preprinted stock of labels to a labeling head operating in timed relation to the gathering machine with the labels for each subgroup being timed to coincide with the arrival at the labeling head of the particular magazines produced for that subgroup,

monitoring the feeding of signatures at each gathering pocket to detect a misfeed or nonfeed at each pocket instructed to feed during each machine cycle,

whenever an error is detected, tracking the defective magazine affected by the error in its subsequent passage through the gathering machine,

rejecting the defective magazine after it leaves the gathering machine,

maintaining a cumulative count of each actuation of each pocket of the gathering machine,

comparing the cumulative error count with the cumulative actuation count and deriving an error rate,

for each subgroup, applying the error rate to the number of magazines to be produced for the subgroup to estimate a predicted number of defective magazines for that subgroup, and

for the same subgroup, operating the gathering machine for an additional number of cycles in excess of the number of subscribers in that subgroup to produce an additional number of magazines equal to the predicted number of defective magazines.

3,917,253

FOLDING MACHINE FOR SOFT GOODS

Conrad Arbter, Mittelweg 1 1/10, Saal an der Saale, Germany

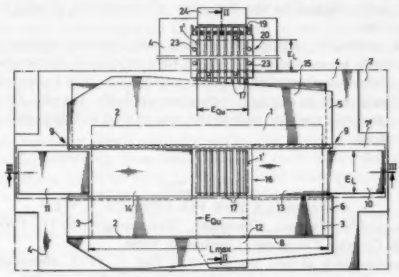
Filed Aug. 23, 1973, Ser. No. 391,168

Claims priority, application Germany, Sept. 5, 1972, 2243594

Int. Cl.[2] B65H *45/18*

U.S. Cl. 270—84 **1 Claim**

1. A folding apparatus for the folding of soft goods comprising a pair of upper folding plate members, means for driving said folding plate members to move in a direction opposite to each other in a horizontal plane and a plane transverse to said horizontal plane, a pair of transverse folding arms vertically spaced below said pair of upper folding plate members and having opposed folding edges, means for driving said transverse folding arms to move in a direction opposite to each other in a horizontal plane, a pair of longitudinal side folding arms horizontally movable in different planes with respect to each other and vertically spaced between said folding plate members and said transverse folding arms, means for driving said longitudinal side folding arms to move in a direction opposite to each other, a transverse folding plate arranged in a region lying between said folding edges of the transverse folding arms, means for inserting said transverse folding plate into said region between said pair of transverse folding arms and means for pressing said transverse folding plate onto a bearing surface, said longitudinal side folding arms and said upper folding plate members being arranged to form a first group of folding means while said transverse folding plate and



said transverse folding arms are arranged to form a second group of folding means, an auxiliary fold supporting plate, and means for moving said folding support plate in a predetermined cycle between an operating position vertically spaced above a surface area formed by said transverse folding arms, and a rest position vertically spaced below said longitudinal side folding arms thereby supporting a prefolded good after completion of the folding operation by said first group of folding means and for transferring said good to said second group of folding means.

3,917,254

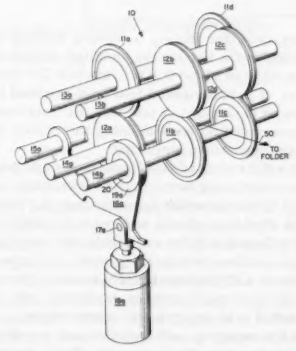
APPARATUS FOR FOLDING OF A WEB

Howard N. Watrous, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 203,806, Dec. 1, 1971, abandoned. This application Oct. 25, 1973, Ser. No. 409,494

Int. Cl.[2] B65H *45/22*

U.S. Cl. 270—86 **3 Claims**



1. An apparatus for predisposing a moving web of disposable diaper material or the like having an initial thickness, prior to compression, of from about 0.100 to about 0.250 inches to fold along at least one predetermined fold line, said apparatus comprising:

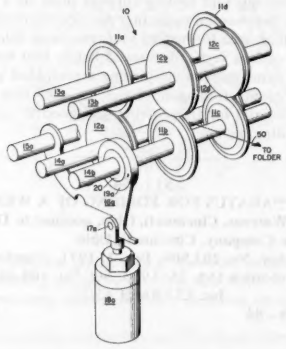
a. a male roll having an arcuate convex raised periphery, said arcuate convex raised periphery having a minimum width approximately 1.7 times greater than the thickness of said web prior to compression;
b. a mating female roll having an arcuate concave peripheral groove, said groove having a minimum width approximately equal to the sum of the width of said arcuate convex raised periphery plus twice the thickness of said web prior to compression;
c. means for engaging said web between said mating rolls so that the axis of rotation of each of said rolls is perpendicularly aligned to the direction of movement of said web; and
d. means for urging said mating rolls together against said web to compress said web to a minimum thickness of between about 0.004 inches and about 0.008 inches while said web is engaged between said rolls, thereby flexing and pressing said web in the area of said web between said rolls.

3,917,255

APPARATUS FOR FOLDING OF A WEB

Howard N. Watrous, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 203,806, Dec. 1, 1971, abandoned.
This application Oct. 25, 1973, Ser. No. 410,005
Int. Cl.² B65H *45/22*
U.S. Cl. 270—86 **3 Claims**



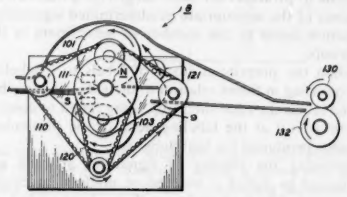
1. An apparatus for folding a moving web of disposable diaper material or the like having an initial thickness, prior to compression, of from about 0.100 to about 0.250 inches along a multiplicity of predetermined fold lines oriented parallel to the direction of movement of said web, the innermost pair of said predetermined fold lines defining the central portion of said web, said apparatus comprising:
a. a male roll for each of said lines, each male roll having a convex raised periphery, said convex raised periphery having a minimum width approximately 1.7 times greater than the thickness of said web prior to compression;
b. a mating female roll for each male roll, each female roll having a concave peripheral groove, said groove having a minimum width approximately equal to the sum of the width of said raised convex periphery plus twice the thickness of said web prior to compression;
c. means for engaging said web between a mating pair of male and female rolls along each of said predetermined fold lines;
d. means for driving said male and said female rolls in synchronization with the movement of said web;
e. means for urging each mating pair of rolls against said web to compress said web to a minimum thickness of between about 0.004 inches and about 0.008 inches while said web is engaged between said rolls, thereby predisposing said web to fold along saud predetermined fold lines;
f. a board folder having an uppermost surface and a lowermost surface, the infeed width of said board folder being at least equal to that of said web prior to folding, said board folder tapering to a width substantially equal to the width of the central portion of said web lying between the innermost pair of said predetermined fold lines; and
g. guide means for directing the lateral edge portions of said web inwardly into superposition with the lowermost surface of said board folder along said predetermined fold lines.

3,917,256

DUAL PURPOSE SHEET HANDLING APPARATUS

Charles J. Kubasta, Plano, Tex., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 7, 1973, Ser. No. 422,822
Int. Cl.² B65H *29/00*; **B65G** *42/24*
U.S. Cl. 271—65 **4 Claims**



1. In a reproducing system in which simplex and duplex copies are made in a processor and then distributed, an improved sheet handling apparatus comprising:
a rotatable frame,
first and second roll means supported by said rotatable frame defining a nip for receiving copy sheets from a processor,
first drive means for continuously driving said first roll means on its axis,
second drive means for rotating said frame carrying said first and second roll means about an axis through said nip at substantially the same speed and in the same direction as that of said first roll means, and
control means to actuate said second drive means in response to signals to rotate said frame carrying said roll means about an angle of **180°** about an axis through said nip while said first drive means is continuously driving said first roll means such that there is no apparent movement of said roll means to effect the top of the sheets becoming the bottom and the trailing edge thereof becoming the leading edge.

3,917,257

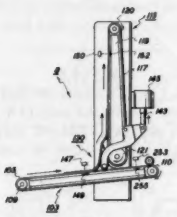
SHEET INVERTER APPARATUS

John R. Caldwell, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 319,835, Dec. 29, 1972, abandoned.
This application Apr. 22, 1974, Ser. No. 463,215
Int. Cl.² B65H *29/00*
U.S. Cl. 271—65 **5 Claims**

1. In a reproducing system in which simplex and duplex copies are made in a processor and then distributed, an improved sheet handling apparatus comprising:
first transport means for receiving copy sheets from a processor,
second transport means including bi-directionally driven perforated belt means advanced over a vacuum source positioned intermediate to said first transport means and extending in a substantially upward direction,

deflector means positioned at the junction of said first and second transport means including at least one member pivotally mounted to move from a first position away from the sheet path of said first transport means to a second position in a path complementary to each of said transport means,



and control means to move said pivotable member from said first position to said second position to direct the sheet positively upwards onto said second transport means and to reverse the direction of said second transport means to return the sheet positively downwards to said first transport means with trailing edge becoming leading edge.

3,917,258

SHEET FEEDING EQUIPMENT

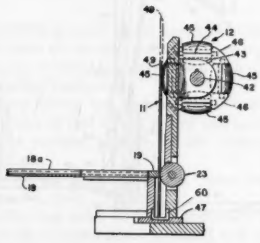
Robert J. Miller, Salford, Pa., assignor to Decision Data Computer Corporation, Horsham, Pa.

Filed June 1, 1973, Ser. No. 365,855

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl. B65H *3/06*

U.S. Cl. 271—9 **18 Claims**



5. Punched card equipment for feeding punched cards from a supply deck, feeding means offset from one edge of the deck for sequentially feeding cards in a path in a direction paralleling the plane of cards in the deck, and mechanism for transferring individual cards edgewise from an end of the deck in a direction transverse to said one direction and into said feed path, said mechanism including a transfer assembly, said assembly being mounted for rotation on an axis offset from and paralleling the cards in the deck and further including a plurality of rotatable friction elements, each said element having its rotative axis generally oriented so that it is tangent to a circle having as its center the axis of the assembly, said elements being oriented so that upon rotation of the assembly a friction element engages with the surface of a card and transfers the card to the sequential feeding means, intermittently operable means for rotation of the assembly by an amount which offsets said card into said feed path, the friction elements being freely rotatable about their own axis so that any element in contact with the card as it is advanced by the sequential feeding means permits unrestricted card advancement in said direction paralleling the plane of cards in the deck.

17. In a card feed mechanism, first and second card hoppers, each being adapted to store a deck of cards and being positioned so that the cards in the hopper are oriented in planes which are acutely angled with respect to one another, feeding means located between the two hoppers, and comprising continuously driven friction roll means adjacent each magazine, said roll means being offset from the cards in each magazine, said friction roll means being oriented to move cards along converging feed paths, there being one feed path for each hopper selectively operable mechanism for offsetting individual cards edgewise from the end of the deck in each hopper into position to be advanced by said friction roll means along the feed path associated with that hopper, said offsetting mechanism including a mounting shaft adjacent each deck being spaced in parallel relationship with the cards in the deck and including a friction roller element carried by each said shaft and being freely rotatable on an axis which is normal to a radius extending from the axis of the shaft, said roller element being movable upon rotation of said shaft into contact with the surface of the end sheet to offset the end card in the magazine, means for selectively operating said offsetting mechanism to offset cards from one or the other of said decks, and pinch roll means operable when a card is in offset position for pressing the offset card into contact with said friction roll means and means for operating said pinch roll means following movement of a card to said offset position.

3,917,259

STEPPED REAR STRAP FOR BOTTOM FEED SEPARATORS

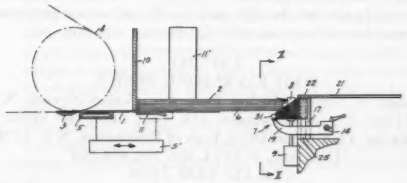
Gennaro Salvade, Pieeraz-Mur E., Switzerland, assignor to J. Bobst & Fils S.A., Switzerland

Filed May 9, 1974, Ser. No. 468,390

Claims priority, application Switzerland, June 21, 1973, 9189/73

Int. Cl.[2] **B65H** *1/06*

U.S. Cl. 271—133 **9 Claims**

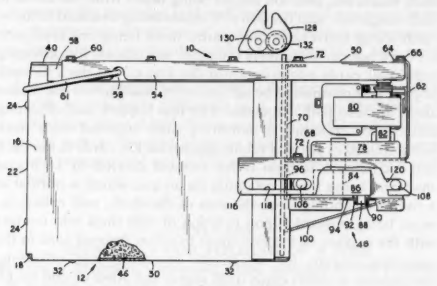


1. In a device for feeding sheets one at a time from a stack of sheets, the device comprising a frame supporting a front gauge, front and rear stack supports and a rear stop to define means for receiving a stack of sheets, means for shifting a leading edge of each of the sheets against the front gauge and means reciprocated between a pair of positions for feeding the lowermost sheet of the stack beneath the front gauge, the improvements comprising said rear stop having a plurality of spaced abutment surfaces, each disposed at different levels to provide the rear stop with a stair step cross-sectional configuration, and means for mounting said rear stop in the frame for vertical movement relative to the front gauge with the abutment surfaces moving in substantially vertical planes so that during a return stroke of the feeding means, a rear edge of the lowermost sheet of the stack is engaged on one of the abutment surfaces which prevents shifting of the lowermost sheet from its aligned position relative to the front gauge.

3,917,260
BILL STACKING MECHANISM

Oliver G. Okkonen, Comstock Park, and Lloyd D. Herring, Jenison, both of Mich., assignors to Rowe International, Inc., Whippany, N.J.

Filed Dec. 6, 1973, Ser. No. 422,266
Int. Cl.[2] B65H *29/46, 31/06*
U.S. Cl. 271—181 **10 Claims**



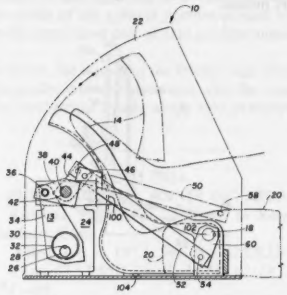
1. Apparatus for stacking elongated bills received from a bill acceptor or the like which delivers an acceptable bill in the direction of the greater longitudinal length thereof and which frees a bill upon delivery thereof, including in combination, a cash box having an elongated mouth, retaining lips extending along the longitudinal edges of said mouth, means forming a narrow elongated escrow chamber in front of said mouth and adapted to receive a freed bill with said bill supported on one of the shorter lateral edges thereof, means at the outlet of said acceptor for imparting to a bill being delivered from said acceptor to said escrow chamber longitudinal crease to inhibit movement of said bill from said position in said escrow chamber in which the bill is supported on said shorter lateral edge thereof after being freed, a flat ram elongated in the direction of elongation of said mouth, the dimension of said ram being such as to engage a bill over a major part of the area thereof, means mounting said ram for movement from a home position at a side of said chamber remote from said mouth across said chamber and through said mouth past said retaining lips and back to said home position to carry a bill from said chamber into said cash box through said mouth and means responsive to operation of said acceptor for moving said ram.

3,917,261
FOOT EXERCISING DEVICE

Samuel N. Small, 920 Val Park Ave., Valley Stream, N.Y. 11580; Bernard Friedman, 116 Wood Lane, and Victor B. Kavits, 11 Autumn Drive, both of Hauppauge, N.Y. 11787

Filed Aug. 5, 1974, Ser. No. 494,508
Int. Cl.[2] A63B *23/04*
U.S. Cl. 272—57 D **4 Claims**

1. An improved foot exercise device comprising a pair of foot pedal structures operatively mounted for pivotal movement 180° out of phase with each other about a front pivot axis oriented transversely of the plane of pivotal movement of said foot pedal structures, a first shaft journalled for rotation along a second motion axis disposed rearwardly and substantially parallel to said front pivot axis, a powering motor and a cranking mechanism disposed at opposite ends of said first shaft, a second shaft disposed along a third motion axis above and substantially parallel to said second motion axis and operatively connected to be actuated in oscillating movement by said cranking mechanism of said first shaft, link means connected between said second shaft and said foot pedal structures for transmitting oscillating movement of said second shaft so as to cause 180° out of phase pivotal movement in said foot pedal structures, said link means including two cooperating first links which are each connected to extend radially of said first pivot axis in 180° out of phase relationship, and two second links which are each connected from said second shaft to each of said first links, a counting switch means mounted in counting relation adjacent one end of said second shaft to record each oscillating traverse of said second shaft, and a movement-opposing device mounted adjacent the opposite

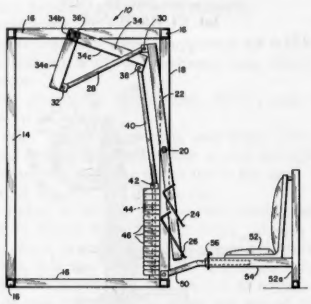


end of said second shaft to selectively resist oscillating movement thereof, whereby said motor operates said exercise device during a passive phase and at other intervals the patient operates said device using an effort dictated by said selected resistance to movement of said second shaft.

3,917,262
LEG EXERCISING APPARATUS

Larry A. Salkeld, 928 Harvard Road, Monroeville, Pa. 15146

Filed Jan. 31, 1974, Ser. No. 438,396
Int. Cl. A63b *23/04*
U.S. Cl. 272—58 **4 Claims**



1. An exercising apparatus of the leg-press type comprising:

a. an upstanding box-like frame,

b. at least one pair of foot pedals,

c. a vertically positioned foot pedal supporting member fixed to said foot pedals and pivotally mounted on a horizontal member attached to said frame for pivoting about a horizontal axis,

d. a weight supporting means extending vertically through a plurality of weights slideably mounted on said box-like frame for vertical movement relative to said frame whereby a predetermined number of said weights may be attached to said weight supporting means for movement therewith,

e. linkage means pivotally mounted on said box-like frame connecting said foot pedal supporting member and said weight support means so that force exerted upon said foot pedals acts at a mechanical disadvantage to raise said weight supporting means, said linkage means consisting of a bellcrank pivotally supported by a horizontal pivot means fixed to the top of said box-like frame, a first rigid

link pivotally secured at one end to the end of said foot pedal supporting member and at the other end to said bellcrank, and a second link pivotally secured at one end to the opposite end of said bellcrank and pivotally secured at the other end to said weight supporting means, and

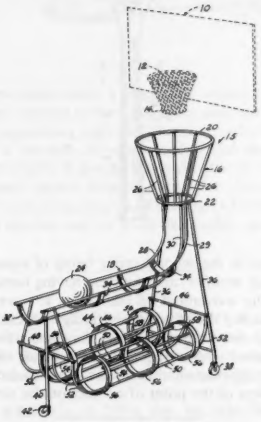
f. a seat adjustably fixable to said frame in front of said foot pedals whereby an exerciser seated in said seat may exert a force upon said foot pedals to exercise his legs.

3,917,263

FREE THROW BASKETBALL RETURN

William D. Wiley, P.O. Box 66, Foster, Okla. 73039

Filed Oct. 29, 1974, Ser. No. 518,849
Int. Cl.[2] A63B *63/04, 69/00*
U.S. Cl. 273—1.5 A **1 Claim**



1. A basketball practice apparatus, comprising:

vertically open throat means formed from rod-like material defining an inverted truncated conical shape for receiving a descending basketball;

chute means having one end portion coaxial with the depending end of said throat means and terminating, at its other end portion, laterally of the vertical axis of said throat means;

a plurality of legs supporting said throat means and said chute means; and,

a combination leg brace and ball supporting rack extending horizontally between and connected with said legs below said chute means,

whereby, the momentum of a falling basketball passing through said throat means and said chute means returns the basketball toward a player near the terminal end of said chute means.

3,917,264

BILLARD GAME APPARATUS

Douglas B. Davidson, and Randy D. Sines, both of E. 4207 29th St., Spokane, Wash. 99203

Filed Aug. 28, 1974, Ser. No. 501,059
Int. Cl.[2] A63D *15/00, 15/08*
U.S. Cl. 273—3 R **3 Claims**

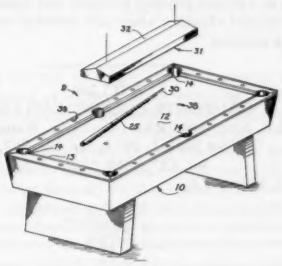
1. A billiard game apparatus for use in playing a game of billiards on a billiard table, said billiard table having a playing surface, peripheral cushions defining the boundaries of said playing surface and ball pockets intermediate the cushions about said playing surface, said apparatus comprising:

a plurality of billiard balls supportable on a playing surface, said plurality of billiard balls including a cue ball and object balls, each ball including means which emits luminescent light in the visible spectrum of such intensity as to be clearly visible to the naked eye when subjected to sufficient ultraviolet rays in the black light band;

a boundary indentifying means adjacent substantially the entire length of said peripheral cushions intermediate said ball pockets to identify the boundary of the playing surface, to identify the location of said peripheral rebound cushions, and to indicate the location of said ball pockets between said boundary identifying means;

said boundary identifying means emitting luminescent light in the visible spectrum of such intensity as to be clearly visible to the naked eye when subjected to sufficient ultraviolet rays in the black light band;

radiation means adjacent the playing surface for directing ultraviolet rays of the black light band over the entire playing surface to luminesce the cue ball and object balls supported on said surface and to luminesce the boundary



identifying means without visually illuminating the surface to enable the player to visually observe the billiard balls and their movement with an unusual contrast and effect; and

a cue stick having a forward end with a tip thereon for striking the cue ball to propel the cue ball against at least one of the object balls to direct at least one of said object balls into one of the pockets, said forward end having a portion thereof including means which emits luminescent light in the visible spectrum of such intensity as to be clearly visible to the naked eye when subjected to sufficient ultraviolet rays in the black light band to enable the player to visually observe the movement of the cue stick in relation to said cue ball as the cue ball is struck by the cue stick and thereby concentrate more fully on the execution of a billiard shot utilizing the peripheral cushions as located by the luminescent boundary identifying means and further utilizing the luminescent object balls.

3,917,265

PNEUMATIC BALL EJECTING MACHINE

Michael Robert Schrier, Silver Spring, and Jack Michael Eichner, Greenbelt, both of Md., assignors to Michael Robert Schrier; Jack Michael Eichner; Martin S. Sachs and Marvin Reich, all of Washington, D.C.

Filed Mar. 12, 1973, Ser. No. 340,508
Int. Cl. F41f *1/04*
U.S. Cl. 273—30 **18 Claims**

6. Apparatus for ejecting tennis balls, comprising:

means for generating air pressure for ejecting tennis balls;

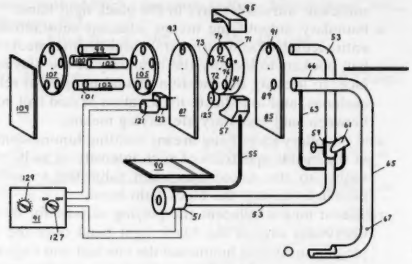
means for generating a vacuum;

a reservoir for holding a plurality of balls at a first level;

means for lifting tennis balls one at a time from said reservoir to a second level regardless of the number of balls present in said reservoir;

a magazine containing a chamber having a loading position, said generated vacuum being operatively coupled to said chamber to suck tennis balls into said chamber from said

second level when said chamber is in said loading position;



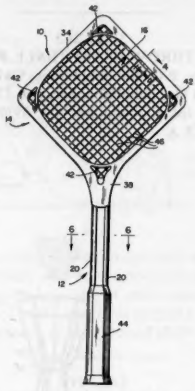
means for moving said magazine from said loading position to an ejection position whereby said tennis ball is ejected from said chamber when said chamber reaches the ejecting position.

3,917,266
COMPOSITE GOLFING IMPLEMENT
Donald B. Kiey, 4008 Riverview Drive, Wausau, Wis. 54401
Filed Sept. 3, 1974, Ser. No. 502,971
Int. Cl.[2] A63B *57/00, 71/14*
U.S. Cl. 273—32 A **2 Claims**

1. A composite golfing implement adapted for suspension adjacent to the upper portion of a golf bag, said element being a unitary structure including a small horizontally disposed rake at the top, upturned teeth on said rake, an integral shank aligned and extending oppositely from said teeth, the upper end of said shank being apertured to permit tying thereon of an elastic cord, the lower end of said shank spaced from said rake, and a hand element aligned with the shank and integral therewith, and fingers on the hand element pointed away from said rake as a glove drier.

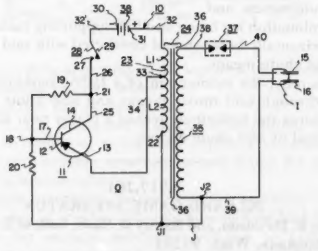
3,917,267
TENNIS RACKET
Charles A. McGrath, 509A Nevada St., Sausalito, Calif. 94965
Filed Mar. 23, 1973, Ser. No. 344,102
Int. Cl.[2] A63B *49/02, 51/08*
U.S. Cl. 273—73 C **8 Claims**

1. A racket suitable for use in propelling a game projectile by striking the projectile, said racket comprising a frame including a head and a manipulating stem, string means forming a projectile striking matrix in the head, the head including means providing substantially uniform response characteristics over the striking matrix, said uniform response means including a first pair of substantially straight parallel sides and a second pair of substantially straight parallel sides in said head, each of the sides of the second pair of sides being substantially equal in length to the sides of the first pair, a first series of string reaches spanning between the first pair of sides, and a second series of string reaches spanning between the second pair of sides, all of the string reaches in the first series being of equal length and parallel to one another, all of the



string reaches in the second series being of equal length and parallel to one another, and the stem having handle means for facilitating the movement of the racket to various positions and for impelling the striking matrix against the projectile to propel the projectile during game play, the axis of the stem being coincident with a diagonal of the head, whereby effective striking response characteristics will be substantially constant regardless of the point of contact on the striking matrix.

3,917,268
SPARK GAP TYPE ELECTRIC SHOCK-PRODUCING PROD
Bruce K. Tingey, and Robert Kent Howcroft, both of Orem, Utah, assignors to H & T Industries, Orem, Utah
Filed June 10, 1974, Ser. No. 477,660
Int. Cl.[2] F41B *15/04*
U.S. Cl. 273—84 **7 Claims**



1. An electrical shock-producing prod including, in combination: an oscillator means for producing a train of pulses; switch means coupled to said oscillator means for selectively turning said oscillator to free-running and also off conditions; battery means coupled to said oscillator means for powering the same; a transformer winding means coupled to said oscillator means for amplifying said pulses; spark gap means for cataclysmically conducting high-potential electrons across the gap thereof; and mutually spaced probes coupled across said

transformer winding means, said spark gap means being serially interposed between one of said probes and said transformer winding means.

3,917,269

S-SHAPED THROWING OBJECTS AND HORIZONTAL TARGET

Marcel Paquette, 393 Crestwood Drive, Cheshire, Conn. 06410

Filed Mar. 9, 1973, Ser. No. 331,294
Int. Cl.[2] A63B 71/02
U.S. Cl. 273—95 R 4 Claims

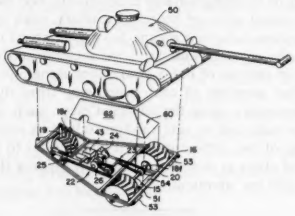
1. A game comprising a throwable object, a horizontally disposed bar adapted to be a target for said throwable object, means for supporting said bar above a surface, said object comprising a member of substantially rigid material formed into a substantially S-shape, the ends of said member being continued and turned back to form hook-like bights larger than the greatest cross-section of said bar, whereby said object is thrown at the bar and the hook-like bights can be caught on the bar.

3,917,270

RADIO CONTROLLED SURFACE TARGET

John Floyd Gothard, Jr., El Toro; Richard Edward Dodd, Santa Ana, and William Carl Peterson, Newport Beach, all of Calif., assignors to Celesco Industries Inc., Costa Mesa, Calif.

Filed Nov. 4, 1974, Ser. No. 520,786
Int. Cl.[2] F41J 9/02
U.S. Cl. 273—105.2 10 Claims



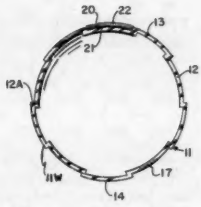
1. In a ground target for simulating moving ground vehicles:
a. a frame having wheels disposed thereon;
b. running gear affixed to said frame for operating and maneuvering said target, and
c. means disposed on said target for receiving radio signals and controlling said running gear, wherein the improvement comprises:
d. a lightweight, interchangeable, frangible target envelope formed in the shape of a ground vehicle affixed to said frame, and
e. an armored shield positioned on said frame under said target envelope and defined to cover said running gear and said receiving and controlling means, thereby protecting said running gear and said receiving and controlling means from damage by weapons.

3,917,271

BALL FOR TARGET GAMES

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840, and Allen M. Elfman, 219 E. 83rd St., New York, N.Y. 10028

Continuation-in-part of Ser. No. 471,760, May 20, 1974. This application Nov. 5, 1974, Ser. No. 521,027
Int. Cl.[2] A63B 65/00, 39/06, 69/36
U.S. Cl. 273—106 R 8 Claims

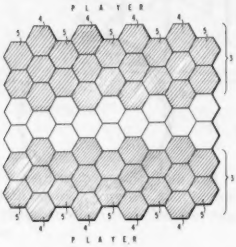


1. A missile for use in target games employing a target which is composed of a planar sheet including a substantial area of pile material having upstanding filamentary formations protruding therefrom which are adapted to engage and hold said missile against any of the various portions of the target which the missile may strike during playing said game,
said missile being formed of a thin-walled light weight generally convex shaped hollow body forming a self supporing bulbous enclosure in the shape of a sphereoid,
the outer surface of the wall of said hollow body defined by convex outer portions thereof surrounding a plurality of oblong indentations therein wherein the depth of each indentation is substantially constant throughout the indentation and wherein each indentation extends almost halfway around said sphereoid body,
a plurality of oblong sections of sheet-like fastening material each configured in contour to the contour of a respective of said indentations,
each of said oblong sections of sheet-like fastening material being secured within a respective indentation in the wall of said hollow body of similar contour thereto,
each of said oblong sections of sheet-like fastening material having a multitude of filamentary formations which are cantelever supported and protrude outwardly from said fastening material in a manner such that they extend substantially radially outwardly from said hollow body when said oblong sections of said fastening material are secured within said indentations in engagement with the bottom walls thereof,
each of said filamentary formations of said fastening material having a shank portion which is formed with an end portion which extends outwardly of the shank portion and extends backwardly in the direction of said fastening material to define a hook-like formation,
said hook-like formations of filamentary fastening material being configured and protruding from the sections of said fastening material in a manner such that they project a degree beyond the surface of those portions of said hollow body which are disposed between said indentations to permit said hook-like formations to engage the formations of the target which said missile strikes to retain said missile thereagainst,
said oblong sections of sheet-like fastening material being configured and spaced apart around the surface of said sphereoid body in a manner such that, regardless of which portion of said sphereoid body engages said substantial area of target pile material, a sufficient number of the hook-like formations of said oblong sections of fastening material will engage and become attached to the filamentary formations of said target and retain said sphereoid body against said target.

3,917,272
BOARD GAME APPARATUS

Jose S. Aldea, 63-C Kitanlad St., Quezon City, Philippines

Filed July 11, 1974, Ser. No. 487,494
Claims priority, application Philippines, July 12, 1973, 14816
Int. Cl.² A63F 3/00
U.S. Cl. 273—131 AD 2 Claims

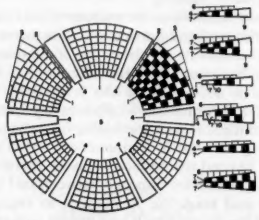


1. A game to be played by two opposing players comprising in combination, a game board formed by 58 connected hexagonal spaces arranged symmetrically in a generally rectangular shape, with nine hexagonal spaces arranged staggeredly along the edge of the board in front of each player, and six hexagonal spaces arranged in column on each of the opposed sides of the board, the 22 hexagonal spaces arranged in staggered rows in front of each player being shaded to define positional rows for each player with a group of fourteen staggeredly arranged unshaded hexagonal spaces between the opposed positional rows of each player, forty-four pieces designated as houses, 22 pieces for each player and positioned in their respective positional rows for forward, sideward, or backward movement to an adjacent hexagonal space, each of said pieces comprising a rectangular block having on one side thereof a replaceable slide member having suitable indicia thereon.

3,917,273
MULTIPLE CHESS OR CHECKER GAME BOARD

Eldred G. Blakewood, III, 825 Elizabeth St., Baton Rouge, La. 70815

Filed July 19, 1974, Ser. No. 490,095
Int. Cl.² A63F 3/02
U.S. Cl. 273—131 KN 31 Claims



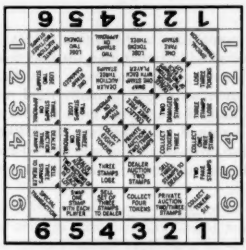
1. A flat, two-dimensional game board apparatus which can accomodate a plurality of sets of pieces controlled by opposing players comprising

a playing area of circular configuration wherein is included a plurality of chessboards of conventional pattern, each of which contains eight discrete spaces of alternating color on a side providing eight ranks and eight files (64 alternately colored smaller areas comprising the total area of a chess board), and additional file areas with files providing an added checkered area separating said chess boards, each of which contains one or a plurality of files of alternating colored squares which adjoin said chess boards, one to the other, to provide a continuous playing area whereon the pieces of opposing players can be moved within the boundaries of each conventional pattern chess board between the added files, or moved across the added files, to provide a continuous playing area.

3,917,274
STAMP GAME

Henry Cornelius George Carey, 12 Grant St., Brighton, BN2 2UN, England

Filed Feb. 19, 1974, Ser. No. 443,680
Claims priority, application United Kingdom, Feb. 27, 1973, 9598/73
Int. Cl.² A63F 3/00
U.S. Cl. 273—134 D 6 Claims



1. Apparatus for playing a board type game comprising

a chart, said chart being defined by a matrix of squares,

instructions for proceeding in said game within each of the majority of said squares, the instructions within each square differing from the instructions within a majority of those other squares also having instructions,

a set of index characters along each of at least two adjacent edges of said matrix of squares, and

a pair of indistinguishable random selection means operable to select pairs of index characters, each of said pair of random selection means having identical characteristics to the other of said pair, one member of each pair being from one set of index characters along one edge, and the other member of each pair being from the other set of characters along the adjacent edge, each pair of characters selected by said random selection means permitting one of two different sets of instructions to be indexed on said chart as desired by the player unless the members of a pair are identical.

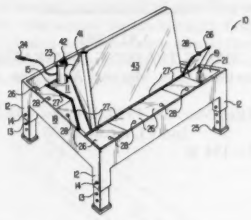
3,917,275
GAME SUPPORT TRAY

Elliott J. Alpher, 2201 Virginia Ave., NW., Washington, D.C. 20037

Filed Aug. 13, 1974, Ser. No. 497,088
Int. Cl.² A63F 9/00
U.S. Cl. 273—136 A 3 Claims

1. A game support tray comprising: a base member; a plurality of walled compartments having spring closure means at the top, the compartments being positioned around the outer portion of the upper surface of said base member; said base member being formed in the shape of a trapezoid having two parallel sides, one of which is longer than the other, and said walled compartments being positioned along said longer parallel side and the two sides adjacent said longer side, a plurality of collapsible leg members attached to the lower portion of said base member; an electrical receptacle mounted on said

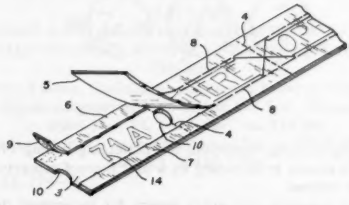
base member and adapted to receive the electrical plug of a game carried by said tray; and means for electrically connecting said receptacle to the electrical power source of an automobile cigarette lighter.



3,917,276
CHANCE TICKET

Nathan M. Green Barg, Sharpsburg, Pa., assignor to Joseph Diego, Pittsburgh, Pa., a part interest

This application Dec. 29, 1971, Ser. No. 213,845
Continuation of Ser. No. 878,285, Nov. 20, 1969, abandoned.
The portion of the term of this patent subsequent to Feb. 4, 1990, has been disclaimed.
Int. Cl. A63b *71/06*
U.S. Cl. 273—139 **2 Claims**



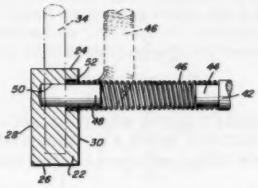
1. A chance roll of tickets comprising a two-ply longitudinal strip, one ply comprising a strip of tickets detachably secured together by lateral perforations and holes, the other ply comprising a covering strip adhered to said strip of tickets only along the entire longitudinal edge portions, leaving an unadhered central panel portion, and covering the entire surface of said strip of tickets including said perforations and holes, said central panel portion bearing indicia in random sequence from ticket to ticket, longitudinal perforations on only said covering strip at the inner border of the adhered edges and extending along the entire length thereof, whereby after tearing one or more tickets and covering strip portion and stripping said covering strip portion along said longitudinal perforations said indicia will be exposed.

3,917,277
GOLF PUTTER WITH DIRECTION INDICATOR

James H. Beck, 202 Hartigan Road, Ingleside, Ill. 60041, and Robert C. Beck, 1211 Hutchings, Glenview, Ill. 60025

Filed Sept. 24, 1974, Ser. No. 508,762
Int. Cl.² **A63B** *53/04*
U.S. Cl. 273—163 R **6 Claims**

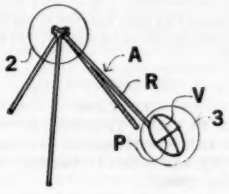
1. A golf putter comprising a club head including a body of generally rectangular configuration and including substantially planar and parallel front and rear surfaces and substantially planar and parallel top and bottom surfaces oriented perpendicular to the front and rear surfaces, a shaft extending upwardly from the top surface of the body and rigidly affixed to the body in inclined relation to the top surface, and an indicator extending rearwardly from the rear surface in perpendicular relation to the ball engaging front surface and the rear surface in alignment with the center of such surfaces to facilitate alignment of the head with a path of movement of a golf ball when putted toward a hole with the indicator being movable along such a path for enabling more accurate control of the golf club head when putting, said indicator including a flexible member enabling folding of the indicator to a position alongside of the shaft, said indicator being in the form of a cylindrical coil spring having one end anchored to the club head and the other end normally disposed remote from the rear face of the club head and extending in perpendicular relation thereto with the coil spring being foldable to a position generally alongside of the shaft.



3,917,278
GOLF TRAINING APPARATUS

Douglas E. Steinman, Jr., 850 Petroleum Bldg., Beaumont, Tex. 77701

Filed Sept. 16, 1974, Ser. No. 506,283
Int. Cl.² **A63B** *69/36*
U.S. Cl. 273—183 E **3 Claims**



1. An apparatus for training a golfer in proper movement of swinging a golf club in order to cause movement of a golf ball along a desired path of travel by permitting the golfer to observe motion of the clubhead and body movement during a golf swing, comprising:

a. means for reflecting the golfer's image to the golfer during the swing, said means for reflecting comprising:
   1. a mirror having a convex reflective surface, said mirror reflecting the golfer's image on a central portion thereof when the golfer is in a proper position for a golf swing and further permitting observation of clubhead movement during the swing; and
   2. a plane guide formed on said mirror providing a reference for alignment of the golfer's upper body and the desired path of travel of the golf ball for thereby defining the proper plane of movement of the clubhead during the swing; and

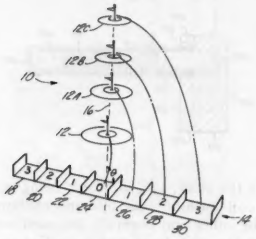
b. means for mounting said means for reflecting in a position for observation by the golfer in said mirror of movement of the clubhead and movement of the golfer's body during the golf swing; and

c. means for adjusting the position of said mirror with respect to said means for mounting to align said plane guide on said mirror with the desired path of travel of the golf ball wherein the golfer may assume a proper golf stance and observe clubhead movement and movement of the golfer's body during the swing.

3,917,279
GOLF GAME APPARATUS

Howard J. Barber, 6320 E. Grand River, Fowlerville, Mich. 48836

Filed Sept. 4, 1974, Ser. No. 503,054
Int. Cl.[2] A63B *67/02, 57/00*
U.S. Cl. 273—176 A **8 Claims**

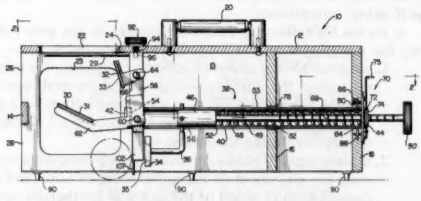


1. A simulated golf course comprising:
a. at least two spaced apart regulation size greens, each green having a ball receiving cup formed therein,
b. a depression formed in each green about the cups thereof and being contoured such that a ball coming therewithin falls into the cup, the depression having a predetermined radius from the center of the cup,
c. the centers of the cups lying along a common axis,
d. a tee for hitting a ball therefrom to the greens, the tee comprising partitioning means to define at least two stalls, the stalls being a predetermined distance from the greens, and
wherein the forwardmost edge of each stall is contiguous to an imaginary straight line, the straight line intersecting the common axis at an angle θ, θ being greater than about 95°.

3,917,280
GOLF PUTTING TRAINING DEVICE

Henry A. Grace, 7333 New Hampshire Ave., Apt. 319, Hyattsville, Md. 20783, and Robert G. Conrad, 1600 Dillon Rd., Maple Glen, Pa. 19002

Continuation-in-part of Ser. No. 313,352, Dec. 8, 1972, abandoned. This application Oct. 30, 1973, Ser. No. 411,028
Int. Cl.[2] A63B *69/36*
U.S. Cl. 273—183 R **19 Claims**

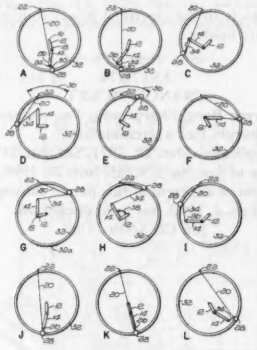


1. A golf ball putting device comprising:
a housing adapted to be detachably secured to a puttable surface;
impact means within said housing for applying a calibrated force to said golf ball;
selection means connected to said force means for determining the calibrated force to be applied; and
sighting and orienting means including at least two sighting points located on said device for defining a sighting line to a cup and for orienting said impact means, whereby a golf ball is projected across said puttable surface at a force determined by the selected calibrated force of said impact means and along a path determined by the orientation of said impact means.

3,917,281
SWING TRAINING APPARATUS

Jess Oppenheimer, 549 Moreno Ave., Los Angeles, Calif. 90049

Filed Mar. 18, 1974, Ser. No. 452,231
Int. Cl. A63b *69/36*
U.S. Cl. 273—191 B **11 Claims**



1. Swing training apparatus for perfecting timing of the swing of a device to be swung by a user thereof comprising:
a guide means;
a slider engaging said guide means for movement therealong;
a flexible cord anchored at one end remote from said user and said guide means and attached at its other end to said swing device;
means slidably connecting said slider to said cord between the ends thereof to provide varying lengths of said cord between said slider means and said swing device during the swinging thereof with the smallest length of cord between said swing device and said slider at approximately the position in a desired swing of said device where maximum speed thereof is attained.

3,917,282
SWITCH-OFF DEVICE FOR A RECORD CHANGER

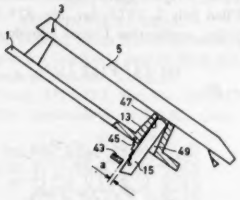
Kurt Eisemann, Berlin, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 19, 1974, Ser. No. 452,607
Claims priority, application Germany, Mar. 20, 1973, 2313740
Int. Cl.[2] G11B *17/00*
U.S. Cl. 274—1 R **7 Claims**

1. A switching device for a record player having a tone arm movable to a rest position, first means for sensing movement of said arm to said rest position, said means moving to a rest position in response to said arm movement, and an electric switch having on and off positions, comprising a mechanism having inoperative and operative states for conditioning at least one part of the record player, and a control means actuated by movement of said first means to said rest position for releasing said switch from said on position only after said mechanism has been returned to the inoperative state, wherein said control means comprises:

means for mounting an element for movement between at least first and second positions;

second means operable while said element is in said first position for sensing movement of said first means to the rest position, said second means having a first state in the absence of sensing said movement of said first means and a second state when movement of said first means to said rest position has been sensed;



means operable only while said second means is in the second state to move said element from the first position to the second position in response to change of said mechanism from the operative to the inoperative state; and

means for moving said switch to the off position in response to movement of said element to the second position.

3,917,283

CABINET OR FOLK ART HOUSE HALF JAPANESE AND HALF WESTERN WITH SOUND UNIT INSTALLED THEREIN

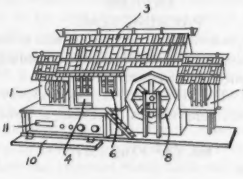
Shigeru Yanase, Osaka, and Katsutoshi Katsura, Ikeda, both of Japan, assignors to Daito Mokko Co., Ltd., Osaka, Japan

Filed Nov. 14, 1973, Ser. No. 415,885

Claims priority, application Japan, Jan. 6, 1973, 48-5521

Int. Cl.[2] G11B *1/00*

U.S. Cl. 274—2 **1 Claim**



1. A portable apparatus for creating a harmony of effects to establish a soothing tranquilizing mood comprising a base, a housing unit exemplifying a miniature Japanese styled house mounted on said base, said house including an enlarged central section and a smaller side section at each side thereof, each of said sections having a front wall, said central section having first and second openings in the front wall thereof, said first opening simulating a window, said second opening simulating a doorway, a movable decorative element simulating a water wheel mounted on the front wall of said central section adjacent to said first opening, motor means within the central section connected to drive said movable decorative element, illuminating means within the central section mounted to shine through said first opening and illuminate the movable element, said illuminating means including a flashing lamp, a pair of switches mounted within said house adjacent said second opening in the central section for independently controlling the operation of said motor means and said illuminating means, a sliding door selectively movably located within said second opening for hiding said switches when said door is closed, sound reproducing means located within said housing unit, said sound reproducing means being electrically connected to both of said switches so that said sound reproducing means is selectively operable when either of said motor means or said illuminating means are operated by said switches, each of said side sections having an opening in the front wall thereof, a speaker mounted within each of said side sections in alignment with the opening therein and electrically connected to said sound reproducing means, means for controlling said sound reproducing means, and a movable cover hingedly mounted on said base and normally covering the control means of said sound reproducing means.

3,917,284

REPRODUCING UNIT AND SOUND CARRIER FOR USE WITH PAGES OF A BOOK AND THE LIKE

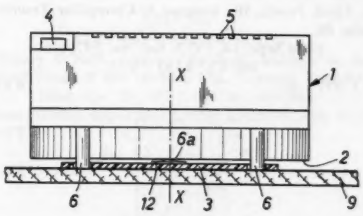
Erich Heinrich Doring, Langer Weg 3, 8052 Moosburg (Isar), Germany

Filed July 30, 1973, Ser. No. 383,505

Claims priority, application Italy, Feb. 19, 1973, 67397/73

Int. Cl.[2] G11B *25/04*

U.S. Cl. 274—9 C **22 Claims**



1. An audio play-back system comprising a substantially flat and thin audio medium having an upper surface provided with an audio means and having alignment means disposed outside the audio groove means, an audio reproducing unit having alignment means adapted to register with the alignment means on the audio medium so as to properly position the reproducing unit in playing relation on the upper surface of the audio groove means, said reproducing unit having an audio pick-up element that is moved from a retracted position into playing engagement with the audio groove means when the reproducing unit is properly positioned on the audio medium, said pick-up element being rotated by a shaft and a motor housed in the reproducing unit for driving said shaft, said motor having a starting circuit, and a switch means for said starting circuit that can be switched on only from the underside of the reproducing unit by coaction of the audio medium with the underside of the reproducing unit facing the audio medium when the reproducing unit is properly positioned on the audio medium so as to start the motor and to keep the motor running only when the reproducing unit is in the correct position relative to the audio medium.

3,917,285

COLLAR FOR JOINT OF UNDERGROUND PIPE

Harold V. Swanson, Morris Plains, and Robert E. Bald, Roseland, both of N.J., assignors to Interpace Corporation, Parsippany, N.J.

Continuation-in-part of Ser. No. 359,967, May 14, 1973. This application Nov. 9, 1973, Ser. No. 414,144

Int. Cl. F16j *15/10*

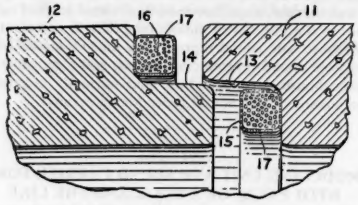
U.S. Cl. 277—1 **13 Claims**

1. A method for sealing a joint of a pipe made of a non-metallic earthen material and having a bell and a spigot, the method comprising steps as follows:

impregnating a distortable band of a cellular water invadable material with a dry hydratable cement which is reactive with water to hydrate thereby forming a water insoluble hard sealant.

placing the band between the spigot and the bell,

engaging the band in the joint by inserting the spigot into the bell,



allowing the band to be contacted with water whereby the hydration takes place.

3,917,286

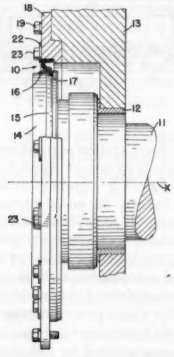
LIP SEAL ASSEMBLY FOR CRANKSHAFTS

Lee R. Loyd, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 14, 1973, Ser. No. 397,446

Int. Cl.[2] F16J *15/32*

U.S. Cl. 277—37 **4 Claims**



1. A lip seal assembly in combination with a stationary housing, having an axial bore and an annular shoulder formed therein, a shaft rotatably mounted in said bore for rotation about a longitudinal axis thereof, an annular hub secured on said shaft and an annular wear ring secured on said hub, an annular groove formed on said hub to underlie said wear ring and an O-ring seal disposed in said groove to sealingly contact said wear ring, comprising

an annular case including an annular outer wall having a recessed end disposed adjacent said shoulder,

a sealing element, mounted on said case extending between said wear ring and said housing, including

an annular flexible lip means circumventing and maintained in dynamic sealing contact with said wear ring,

a first annular portion extending generally radially outwardly from said axis engaged by said case wall end and maintained in static sealing contact axially between said case and said annular shoulder by compressing it thereagainst, and

a second annular portion connected directly to said first annular portion by a reverse bend and extending away from said first annular portion in general parallel relationship with respect to said axis and maintained radially between said recessed end of said annular wall and said shoulder, whereby said second annular portion is maintained in said parallel relationship, and an annular adapter releasably attached to an outboard side of said housing and at least one retainer releasably attached on an outboard side of said adapter and contacting an outboard side of said case to precisely retain said lip seal assembly in place on said housing.

3,917,287

FACE SEALS

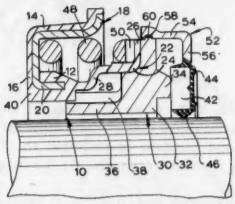
Kenneth Metcalfe, 23 Queengate, Nelson, Lancashire, England

Filed July 2, 1973, Ser. No. 375,595

Claims priority, application United Kingdom, July 5, 1972, 31452/72

Int. Cl.[2] F16J *15/36*

U.S. Cl. 277—38 **10 Claims**



1. A fluid assembly comprising a face seal component and a counterface seal component disposed in axially adjacent relation, and retainer means releaseably interconnecting said seal components, said retainer means being in the form of a clip in axial retaining relation with one of said seal components, and releaseable interlockable connection means between said clip and the other of said seal components for releaseably securing said clip to said other seal component and for facilitating assembly and disassembly of said seal components.

3,917,288

PACKING SEAL

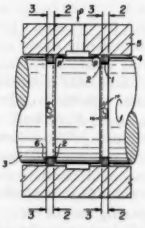
Wolfgang Huber, Schweinfurt, and Anton Marx, Sulzthal, both of Germany, assignors to SKF Industrial Trading and Development Company, Amsterdam, Netherlands

Filed May 31, 1973, Ser. No. 365,449

Claims priority, application Germany, June 6, 1972, 2227374

Int. Cl.[2] F16J *15/16*

U.S. Cl. 277—59 **6 Claims**



1. A seal for closing the space between a rotating shaft and a stationary machine part comprising an annular ring located in an annular slot formed in a circumferential surface of one of said shaft or machine parts, said ring being tensioned radially on one of the rotating or non-rotating parts and axially spaced from at least one of the frontal faces of said slot for the introduction of a fluid media therebetween, at least the face of said ring opposed to the spaced frontal face of said slot having a plurality of arcuate grooves comprising spiral sec-

tions uniformly spaced about the face of said ring parallel to each other and extending curvedly in the same direction with respect to the direction of rotation of said shaft from the inner edge to the outer edge of said ring, said arcuate grooves generating a centripetal flow creating pressure in said fluid medium located between the frontal face of the slot and the opposing face of the ring on rotation of said shaft.

3,917,289

MECHANICAL SEAL

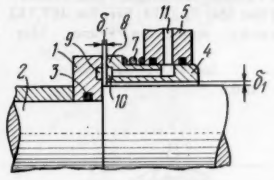
Viktor Vasilievich Ivanov, ulitsa Krasnoprudnaya 26 kv. 26, and Boris Sergeevich Goritsky, proezd Shokalskogo 29 korpus 1, kv. 4, both of Moscow, U.S.S.R.

Filed Aug. 15, 1973, Ser. No. 388,417

Claims priority, application U.S.S.R., July 30, 1971, 1680830

Int. Cl.² F16J *15/40, 15/54*

U.S. Cl. 277—74 **5 Claims**



1. A mechanical hydrodynamic seal for a machine shaft comprising: a shaft and first ring fitted to the shaft and rotatable therewith; said ring being disposed in a space for containing a fluid medium being sealed; a second stationary ring disposed in the body of the machine coaxially with said first rotary ring so that an end of said shaft being sealed passes that the stationary ring with a radial clearance; said movable and stationary rings being so disposed that between opposed faces thereof there is an annular clearance which is substantially smaller than the radial clearance between said shaft and the stationary ring; said movable and stationary rings each being provided with a plurality of recesses in their opposed faces about a common circumference; said movable ring having recesses which vary in number from the number of the recesses in said stationary ring; wtih the recesses in said movable and stationary rings successively defining substantially closed chambers when the recesses mate each other during relative rotation.

3,917,290

ASSEMBLY COMPRISING A PISTON GROOVE, A PISTON RING AND AN INERTIA RING SLIDING IN A CYLINDER

Robert Geffroy, 1, Blvd. Richard Wallace, Neuilly-Sur-Seine Hauts-de-Seine, France

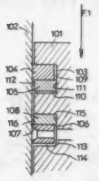
Filed Nov. 28, 1973, Ser. No. 419,480

Claims priority, application France, Nov. 28, 1972, 72.42306

Int. Cl.² F16J *9/00*

U.S. Cl. 277—75 **7 Claims**

1. An assembly comprising a cylinder, a piston, an axially floating piston ring and at least one axially floating inertia ring, in which the piston is moved with an alternating motion, said piston comprising a groove having side flanks and an internal face, said piston ring in said groove having an external face engaging said cylinder, an internal face with clearance relative to the internal face of said groove and side faces, said inertia ring arranged in said groove between one side face of said piston ring and the adjacent flank of said groove, said rings having a combined axial clearance in said groove relative to the entire surfaces of said side faces, said inertia ring including means for sliding in a fluid tight manner on the internal face



of said groove within limits of clearance between said piston ring, said inertia ring and said groove.

3,917,291

HEAT EXCHANGER SEALS

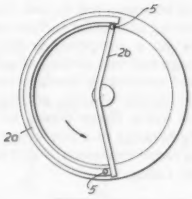
John Sidney O'Neill, Alcester, England, assignor to British Leyland Truck & Bus Division Ltd., Leyland, England

Filed Apr. 10, 1973, Ser. No. 349,868

Claims priority, application United Kingdom, Apr. 12, 1972, 16790/72

Int. Cl.² F16J *15/54*

U.S. Cl. 277—96 A **1 Claim**



1. A seal assembly for the cold side of a rotary heat exchanger which includes,

a. an elongate flexible seal member,

b. a support member,

c. said seal member having two portions, an arcuate portion and a diametral portion,

d. said support member having two portions, an arcuate portion and a diametral portion,

e. each of said support members having a groove extending along its length,

f. said seal members and said grooves in said support members being of complimentary undercut shape so that the seal members are located on the support members,

g. first means to mechanically secure one end of said diametral seal member to said diametral support member against relative longitudinal movement,

h. second means to mechanically secure one end of said arcuate seal member to said arcuate support member against relative longitudinal movement,

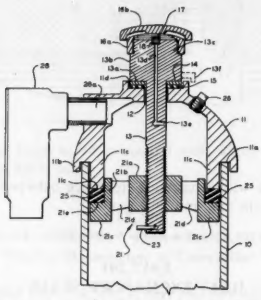
i. a portion of said diametral seal member remote from said secured end abutting said secured end of said arcuate seal member,

j. a portion of said arcuate seal member remote from said secured end abutting said secured end of said diametral seal member.

3,917,292
SEAL ASSEMBLIES FOR WATER WELL CASINGS

Carlyle J. Martin, Pierce Creek Road, R.D. No. 1, Binghamton, N.Y. 13903

Filed Aug. 1, 1974, Ser. No. 493,526
Int. Cl.[2] F16J 15/10
U.S. Cl. 277—110 11 Claims

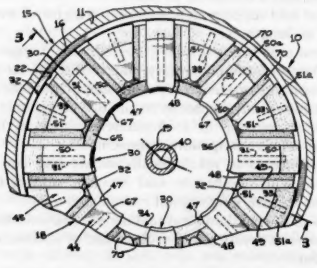


1. A well seal assembly for sealing the upper end of a hollow cylindrical well casing, comprising, in combination: a cap having a first annular surface adapted to seat on said end of said casing, an annular first flange adapted to extend into said casing adjacent the inner wall of said casing, and a bore extending through said cap substantially along the cylindrical axis of said casing; shaft means extending through said bore of said cap means; a lower flange means adapted to be situated within said casing and be supported by said shaft means, said lower flange means having an annular surface extending below said annular first flange; a compressible seal ring situated between said first flange and said surface of said lower flange means; and a threaded connection between said shaft means and said lower flange means, whereby rotation of said shaft means may raise said lower flange means to compress said compressible seal ring between said first flange and said lower flange means, causing radial expansion of said seal ring against said inner wall of said casing.

3,917,293
CONTROLLED CLOSING PATTERN PACKING UNIT FOR BLOWOUT PREVENTER

George E. Lewis, Arcadia, and Fernando Murman, Rancho Palos Verdes, both of Calif., assignors to Hydril Company, Los Angeles, Calif.

Filed June 26, 1974, Ser. No. 483,311
Int. Cl.[2] F16J 15/40; B65D 53/00
U.S. Cl. 277—114 40 Claims



1. In an annular blowout preventer packer unit having a longitudinal axis, the packer adapted to be compressively displaced radially inwardly toward said axis, the combination comprising

a. metallic inserts generally circularly spaced about said axis, the inserts having webs that extends generally longitudinally, and

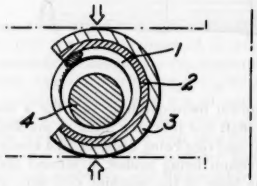
b. an annulus of elastomeric material extending about said axis and embedding said webs so that the webs anchor the material during inward compressive displacement of the packer,

c. the spacing of the webs from said axis and from each other being characterized by differential anchoring about said axis of circularly spaced of the material subject to inward displacement toward said axis.

3,917,294
FLEXIBLE ANNULAR SEAL

Claude Abbes, St. Etienne; Jean Fages, Pierrelatte; Georges Mengus, Grillon; Christian Rouaud, Pierrelatte, and Raymond de Villepoix, Dunzere, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed May 7, 1974, Ser. No. 467,742
Claims priority, application France, May 29, 1973, 73.19488
Int. Cl.[2] F16J 15/00
U.S. Cl. 277—180 6 Claims



1. An annular seal comprising a central core of a metal wire helical spring with continuous turns and high axial compressive stressing closed on itself and torroidal in shape in the inoperative state, a first resilient hard metal envelope substantially covering the outer surface of the spring and having in the inoperative state the shape of a torroidal surface whose generating circle includes a gap, a second independent envelope of ductile metal substantially covering the outer surface of the first envelope and having in the inoperative state the form of a torroidal surface whose generating circle includes a gap substantially co-extensive with the first gap, and a rigid metallic reinforcement strip mounted against the spring inside the first envelope.

3,917,295
FLUID OPERATED VEHICLE BODY LEVEL CONTROL SYSTEM

Mituo Hiruma, Kodaira, Japan, assignor to Nisson Motor Company Limited, Yokohama, Japan

Filed June 28, 1974, Ser. No. 484,239
Claims priority, application Japan, June 30, 1973, 48-73854; July 4, 1973, 48-74686
Int. Cl.[2] B60G 11/26
U.S. Cl. 280—6 H 18 Claims

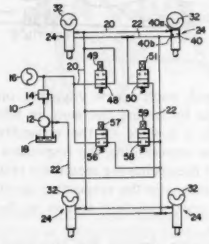
1. In a fluid operated levelling system for a vehicle body having a source of fluid under pressure and a fluid reservoir, adjustors operative to raise and lower the vehicle body and levelling valves communicable with the source and the reservoir through inlets and outlets thereof in response to the level orientation of the vehicle body in respect to the road surface and operative to communicate the adjustors with the source and the reservoir to maintain the vehicle body substantially parallel to the road surface, the improvement comprising:

first electrically controlled valve means connected between the source and the inlets of the levelling valves;

second electrically controlled valve means connected between the source and the inlets of the levelling valves;

second electrically controlled valve means connected between the reservoir and the outlets of the levelling valves; third electrically controlled valve means connected between the source and the outlets of the levelling valves; fourth electrically controlled vave means connected between the reservoir and the inlets of the levelling valves; sensing means sensing planar orientation of the vehicle body relative to road surface orientation and operative to generate an electrical signal in response to lack of parallelism between the vehicle body and the road surface exceeding a predetermined degree being sensed; and

switch means responsive to said electrical signal and being manually switchable between a normal position and a



jacking position, said switch means being operative to control said electrically controlled valve means in such a manner that;

when said switch means are in said normal position, said electrically controlled valve means are controlled to normally connect the inlets of the levelling valves to the source and the outlets of the levelling valves to the reservoir, and in response to said electrical signal to block communication between the inlets of the levelling valves and the source and the outlets of the levelling valves and the reservoir; and

when said switch means are in said jacking position, said electrically controlled valve means are controlled to connect both the inlets and outlets of the levelling valves to the source and block communication between the inlets and the outlets of the levelling valves and the reservoir.

3,917,296

HOLDING MECHANISM FOR HOLDING A SKI BOOT

Ulrich Gertsch, Matten, and Ernst Gertsch, Wengen, both of Switzerland, assignors to Gertsch AG, Interlaken, Switzerland

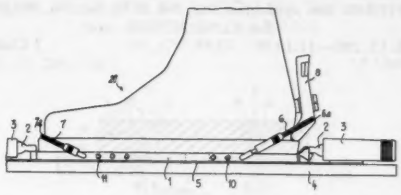
Filed Apr. 20, 1973, Ser. No. 353,003

Claims priority, application Switzerland, May 8, 1972, 6836/72

Int. Cl.[2] A63C *9/08*

U.S. Cl. 280—11.35 K **12 Claims**

1. A holding mechanism for retaining a ski boot and its tread surface on a ski, comprising two bracket members intended to extend forwardly and rearwardly with respect to the ski to engage over the tip of the sole and heel of the boot respectively, one of the said bracket members being provided with a clamping mechanism, said two bracket members each including means for changing the size of the bracket members lengthwise of the ski, means for pivotable mounting said bracket members on the ski, said mounting means and each of said bracket members having cooperating means for selectively positioning said bracket members at desired anchoring locations on the ski to adjustably locate the position of the ski



boot lengthwise of the ski and to accommodate a range of ski boot sizes.

3,917,297

DEVICE TO BE ATTACHED TO A SKI FOR PREVENTING SKI RUNAWAY

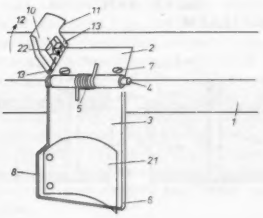
Jakob Fruh, CH 9542 Munchwilen, Thurgau, Schweiz, Switzerland

Filed Sept. 10, 1973, Ser. No. 395,725

Claims priority, application Switzerland, Feb. 13, 1972, 013362/72; Dec. 21, 1972, 018719/72; June 21, 1973, 009088/73

Int. Cl.[2] A63C *7/10*

U.S. Cl. 280—11.13 B **6 Claims**

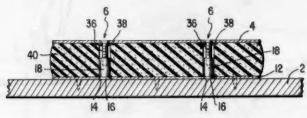


1. A device for attaching to a ski and for effecting automatic braking thereof upon detachment of the ski from the ski binding, comprising mounting means disposed wholly between the ski boot and ski and secured to the ski on the upper surface thereof, a brake plate adapted to be held in a first position flatly against the ski in confronting relation with the upper ski surface and proportioned to lie substantially entirely between the sides of the ski to be in non-interfering relation with running movement of the ski, resilient means for effecting loading on the brake plate to actuate such brake plate to a second position wherein the brake plate is brought out of noninterfering relation and into ground engaging position wherein the movement of the ski is impeded from further movement thereof, locking means having an open locking surface operatively secured to said ski and directly engagable with said brake plate to releasably hold such brake plate in its retracted non-interfering position on the ski, and means for swivably mounting said locking means for angular movement transversely to the movement of said brake plate between its first and second positions, and disposed in relation to the ski boot to be urged into non-locking position, said locking means being held against movement into a locking position by the ski boot until the ski is loosened from the ski shoe or binding.

3,917,298
ADJUSTABLE HARNESS FOR SKI BOOT

William B. Haff, Code 14, Naval Weapons Center, China Lake, Calif. 93555

Division of Ser. No. 274,800, July 24, 1972, Pat. No. 3,817,543. This application May 14, 1974, Ser. No. 469,856
Int. Cl.[2] A63C 9/00
U.S. Cl. 280—11.13 W 5 Claims

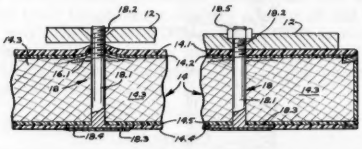


1. In combination with a ski, an adjustable harness for a ski boot comprising a boot-receiving plate adapted to be secured in spaced relationship to the underlying surface portion of said ski and having a central longitudinal axis extending in the same general direction as the longitudinal axis of said ski; and at each end of said plate a pair of independently operable elevating means for selectively varying the space between said ski and said plate disposed on opposite sides of said central longitudinal axis and connecting said boot-receiving plate to said ski whereby the angular relationship between said boot-receiving plate and said ski transverse to said central longitudinal axis may be selectively adjusted.

3,917,299
FASTENER FOR SKI BINDINGS

Peter F. Anderson, 201 First Ave. SW., Grand Rapids, Minn. 55744

Filed Sept. 30, 1974, Ser. No. 510,508
Int. Cl.[2] A63C 11/14
U.S. Cl. 280—11.13 W 12 Claims



1. A fastener for fastening a ski boot binding to a ski, wherein the ski is provided with a bore formed through its thickness, the bore having a downwardly open, enlarged section having an upper surface, the fastener comprising an upright, threaded metal shank for insertion in the bore and having at its lower end a transverse, outwardly extending, flat-bottomed metal flange receivable in the downwardly open, enlarged section of the bore, a shapable, flat-bottomed plastic plug on the flange's bottom surface, the fastener including a cap engageable with the upper surface of a ski boot binding and having threads engageable with the threaded shank, whereby the cap may be threaded from above onto the shank, containing therebetween and securely clamping together a ski boot binding and a ski.

3,917,300
SKI BINDING

Georges Pierre Joseph Salomon, Annecy, France, assignor to S. A Francois Salomon & Fils, France

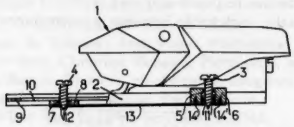
Filed Nov. 30, 1973, Ser. No. 420,452
Claims priority, application France, Dec. 1, 1972, 72.42891
Int. Cl.[2] A63C 9/00
U.S. Cl. 280—11.35 R 8 Claims

1. A device for securing a ski boot fitting to a ski, comprising;

a baseplate for a ski boot fitting, said baseplate having a plurality of apertures extending through the same;

a corresponding plurality of elastic screw holder means, each defining a screw hole, each screw holder means being secured to the baseplate in a corresponding one of the apertures of the baseplate to keep the respective screw hole extending through the aperture at right angles to the baseplate; and

a corresponding plurality of screws, each having an upper head, a stem extending downwardly from the head and threaded from directly below the head to a lower end of the stem and a downwardly tapering, threaded point at



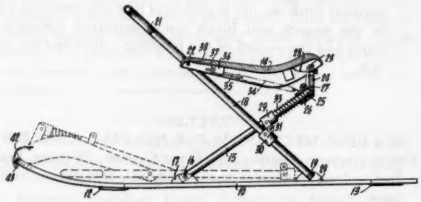
the lower end, each screw engaging one of the screw holder means by having the stem in frictional threaded contact with a surface of the respective elastic screw holder means surrounding the respective screw hole, the screw holder means having means for resisting rotation of said holder means in the respective apertures incident to turning the corresponding screws in the corresponding screw holes;

thereby facilitating driving the threaded points of said screws into the upper surface portion of the ski at right angles to the surface portion for proper mounting of the ski boot fitting, by the baseplate, on the ski.

3,917,301
SNOW MONOSKI

Sergio Fabris, via Alpini 8, 36065 Mussolente (VI), Italy

Filed May 21, 1973, Ser. No. 362,340
Claims priority, application Italy, May 20, 1972, 85567/72
Int. Cl.[2] B62B 13/04
U.S. Cl. 280—12 K 9 Claims



1. A snow monoski comprising

a ski having lateral edges with inwardly curved parts,

an articulated frame attached to said ski and carrying a saddle,

said frame having a front portion defining a handgrip and being tiltably secured longitudinally of said ski between a raised condition and a collapsed condition of minimum overall size,

means to connect said saddle to said frame including

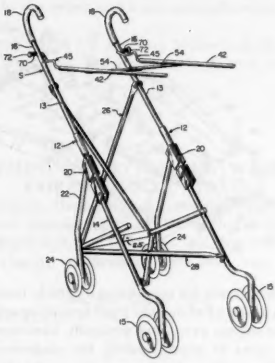
a turnbuckle element,

traction springs rearwardly connected to said frame and forwardly connected to said turnbuckle element sliding in a plate secured beneath said saddle.

3,917,302
FOLDABLE CANOPY FOR BABY CARRIAGES

Albert W. Gebhard, Boulder, Colo., assignor to Gerico, Inc., Boulder, Colo.

Filed June 17, 1974, Ser. No. 480,153
Int. Cl.² B62B 11/00
U.S. Cl. 280—36 B 4 Claims



1. In a baby stroller of the type having main diagonal brace members terminating in upper handle portions, a seat portion, and supporting frame means between said diagonal brace members cooperating to support said baby carriage with said diagonal brace members spaced apart in an extended position when in use and being foldable to permit inward collapsing of said diagonal brace members toward one another when not in use into a compact stored position, the combination therewith of:

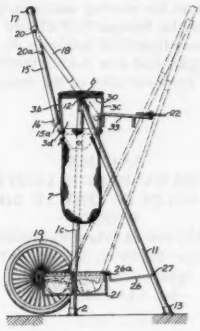
a canopy including a flexible cover and side frame members extending along opposite sides of said canopy and adapted when connected to said baby carriage to extend forwardly in the direction of travel of the baby carriage; an end support member at the rearward end of each side frame member for releasable connection of each side frame member to one of said brace members adjacent to its upper handle portion, each end support member including terminal connecting means connected to a diagonal brace member to permit pivotal swinging movement of said cnaopy about said terminal connecting means and limit stop means on said end support normally limiting forward and downward movement of said canopy to a position extending horizontally and forwardly from said diagonal brace members in spaced relation above the seat portion of said baby carriage; and

releasable brace means extending transversely between said side frame members for holding said canopy in an extended position and being releasable to permit said canopy to collapse inwardly in a direction permitting said side frame members to move inwardly toward one another into closely spaced parallel relation to one another, said releasable brace means being defined by a pair of bars extending transversely inwardly toward one another from said opposite side frame members at a location relatively near the rearward end of said canopy, said bars being pivotally interconnected and having limit stops limiting pivotal movement of said bars to slightly beyond fully extended position, the flexible cover and said bars being dimensionally proportioned such that said flexible cover is elastically stressed in tension when said bars are fully extended whereby said bars are forcibly retained against said limit stops and said opposite side frame members are braced in rigid spaced-apart relation to one another.

3,917,303
COMBINATION GOLF CART AND SEAT

Milton W. Good, 147-37 Ash Ave., Flushing, N.Y. 11355

Continuation-in-part of Ser. No. 383,493, July 30, 1973, abandoned, which is a continuation-in-part of Ser. No. 194,871, Nov. 2, 1971, Pat. No. 3,762,737. This application Sept. 10, 1974, Ser. No. 504,821
Int. Cl.² B62D 1/18
U.S. Cl. 280—36 C 15 Claims

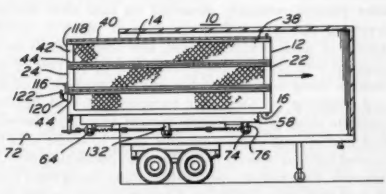


1. In a foldable golf cart having a U-shaped frame comprising an upper transverse portion and a pair of opposite front legs extending down from said transverse portion, a seat on said transverse portion, a pair of wheels disposed on an axis forward of said front legs and above the lower ends thereof, a rear leg pivotally connected at its upper end to said frame and swingable from an operative position in which it angles downwardly and rearwardly to a folded position approximately parallel to said front legs, and a handle for pulling said cart, the improvement comprising a lower support pivotally supported between lower portions of said front legs and extending rearwardly of the wheel axis, said lower support having a plurality of compartments for receiving the heads of individual golf clubs, and an upper support movably carried by an upper portion of said frame and having means for individually receiving the shafts of individual golf clubs, said upper support being movable between a rearward operative position in which it projects rearwardly of said frame and a forward retracted position.

3,917,304
LOADING CONTAINER MEANS

Frances E. Mautz, 7922 Fairfield St., Philadelphia, Pa. 19154

Division of Ser. No. 175,439, Aug. 27, 1971, Pat. No. 3,784,054. This application Dec. 20, 1973, Ser. No. 426,943
Int. Cl.² B62D 21/18
U.S. Cl. 280—43.23 12 Claims



1. A loading container means comprising a body having horizontal top and bottom walls and vertical side walls providing a storage chamber therein, at least one of said walls providing an opening to said chamber of said body, a plurality of

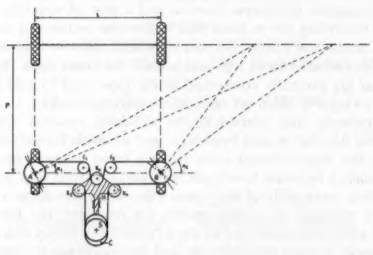
wheel units secured with respect to the bottom wall of said body for movably supporting said body over a supporting surface, said wheel units providing a wheel element movable between a retracted position and an extended position, means for actuating the wheel elements between their retracted and extended positions including pneumatic means, said wheel elements including an arm pivoted at one end and supporting a swivel mounted wheel at the other end, said pneumatic means including a pneumatic cylinder secured at one end with the bottom wall of said body and having its other end pivotally attached to said arm for moving said arm from a retracted position proximate the bottom wall of said body to an extended position away from said bottom wall, and lock means for releasably securing said arm in its extended terminal position substantially perpendicular to the bottom wall of said body.

3,917,305

CONTROL MECHANISM FOR COMPENSATING STEERING ANGLES IN VEHICLE DIRECTIONAL WHEELS

Giuseppe Di Chirico, No. 28, Via della Balduina, Rome, Italy

Filed Apr. 18, 1974, Ser. No. 462,157
Claims priority, application Italy, July 26, 1973, 51671/73
Int. Cl.[2] B62D *3/02*
U.S. Cl. 280—93 **2 Claims**



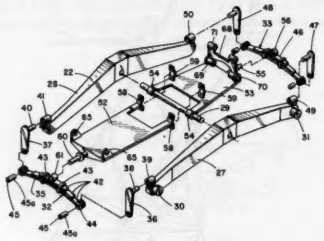
1. A device for compensating the steering angles of two directional wheels of a vehicle comprising in combination first and second control pinions rigidly connected one to the steering knuckle pins of each of the directional wheels for rotation therewith during steering movement, an endless flexible drive element coupling said first and second pinions to one another, a steering pinion operatively coupled to said flexible drive element, a cam element rigidly connected with said steering wheel for rotation therewith, a slide follower member engaging said cam element and mounted for to-and-fro movement under the action of said cam element, first, second and third idler pinions rotatably mounted on said slide member and arranged thereon with their axes of rotation forming the apexes of an isosceles triangle, said idler pinions each being coupled with said flexible drive element, the first of said idler pinions being arranged at the apex formed by isosceles sides and engaging on the outer periphery of said flexible drive element along a first length thereof extending between said first and second control pinions so as to cause said first and second control pinions to perform an oscillating movement in opposite direction to one another upon translation movement of said first idler pinion as a result of said to-and-fro movement of said slide follower member, said second and third idler pinions being arranged at the other two apexes of the isosceles triangle and engaging said flexible drive element on the outer periphery thereof one between said first control pinion and said steering pinion and the other between said steering pinion and said second control pinion.

3,917,306

OFF-THE-ROAD VEHICLE

Herman J. Madler, 108 S. George St., Mount Prospect, Ill. 60056, and Kenneth I. Doane, Sr., 2812 S. Cicero Ave., Cicero, Ill. 60650

Filed Feb. 7, 1974, Ser. No. 440,497
Int. Cl.[2] B60G *19/02*
U.S. Cl. 280—104 **8 Claims**



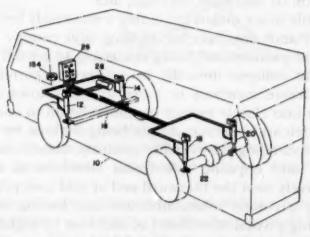
1. A vehicle frame for supporting a vehicle body, said frame comprising a pair of elongated rigid spaced-apart frame arms, central axle means extending generally transversely between the frame arms at approximately the midpoints thereof to provide a forwardly extending portion and a rearwardly extending portion for each frame arm, each frame arm being rotatably secured to the central axle means for rotation about a main axis, a wheel carried by each frame arm adjacent each of the forward and rearward ends thereof, forward connecting arm means extending generally transversely between the forward portions of the frame arms and secured thereto, rearward connecting arm means extending generally transversely between the rearward portions of the frame arms and secured thereto, attaching means connected to each of the connecting arm means and adapted for attaching the frame to a vehicle body, each of the connecting arm means including link means for permitting the distance between the ends of the frame arms to vary as one frame arm rotates about the main axis relative to the other frame arm while maintaining each of the attaching means substantially centered transversely between the frame arms.

3,917,307

VEHICLE LEVELING AND STABILIZING SYSTEM

Harold P. Shoebridge, Escondido, Calif., assignor to ATI Industries, Escondido, Calif.

Filed June 3, 1974, Ser. No. 475,949
Int. Cl.[2] B60G *11/26*
U.S. Cl. 280—104 **11 Claims**



1. A vehicle leveling and stabilizing system for installation in a vehicle having front and rear wheel axles and a frame supported above the axles, the system comprising:

a front pair of double acting hydraulic cylinder units connected between the frame and the end portions of the front axle;

a rear pair of double acting hydraulic cylinder units connected between the frame and the end portions of the rear axle;

fluid conducting means connecting the upper end of each cylinder unit in a pair to the lower end of the other cylinder unit in the pair in cross connected closed loops;

shut off means for selectively shutting off the closed loop connections;

a hydraulic power unit having pressure supply means connected to the upper and lower ends of each of said cylinder units;

and control means for applying pressure from said power unit to the upper and lower ends of each cylinder unit selectively.

3,917,308

ARRANGEMENT FOR SETTING THE CHAMBER OF A PAIR OF VEHICLE WHEELS

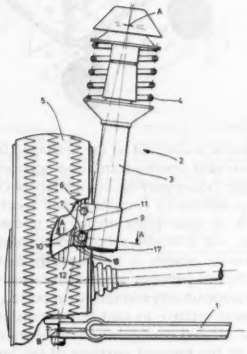
Waldemar Schulz, Dannenbuttel, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Dannenbuttel, Germany

Filed Apr. 11, 1974, Ser. No. 460,030

Claims priority, application Germany, May 30, 1973, 2327609

Int. Cl.[2] B60G *3/02*

U.S. Cl. 280—124 B **13 Claims**



1. An arrangement for setting the camber of a wheel of a vehicle supported on the vehicle frame by a link coupling means, wheel support means and guiding upright elongated shock absorber leg means, comprising

means for fixedly securing said shock absorber leg means at an upper region thereof to the vehicle frame;

an upper set and a lower set of substantially horizontal registering bores formed in the lower region of said shock absorber leg means and in said wheel support means, respectively;

bolt means extending through the bores of one of said sets and securing said shock absorber leg means to said wheel support means; and

camber-setting means, including an eccenter bolt means extending through the bores of the other set and operative, when turned in said bores, for varying the camber setting of said wheel.

3,917,309

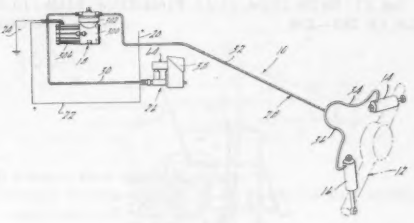
VEHICLE LEVELING SYSTEM

Robert W. Hegel, and Burke A. West, both of Monroe, Mich., assignors to Monroe Auto Equipment Company, Monroe, Mich.

Filed July 18, 1974, Ser. No. 489,728

Int. Cl.[2] B60G *13/14*

U.S. Cl. 280—124 F **47 Claims**



12. The invention as set forth in claim 11 wherein said first and second control elements comprise push buttons on said console.

3,917,310

COLLAPSIBLE CANOPY ASSEMBLY

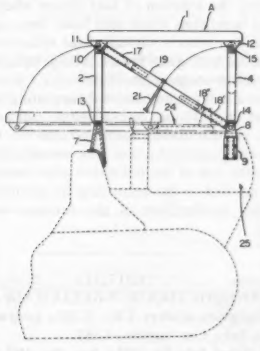
Yoshiji Mitsuishi, Yokohama, Japan, assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 19, 1974, Ser. No. 525,241

Claims priority, application Japan, Nov. 24, 1973, 48-134644

Int. Cl.[2] B60J *7/24*

U.S. Cl. 280—150 C **9 Claims**



1. A collapsible canopy assembly for protecting an operator's station of a vehicle comprising

a roof,

a pair of normally upright transversely spaced front support means each having an upper end thereof pivotally connected to said roof and a lower end pivotally connected to the vehicle,

a pair of normally upright transversely spaced rear support means spaced longitudinally from said front support means and each having an upper end thereof pivotally connected to said roof and a lower end pivotally connected to the vehicle to form a parallelogram-type linkage with said roof and said front support means,

at least one stay diagonally disposed and pivotally interconnected between said roof and adjacent to a lower end of one of said front and rear support means, said stay comprising adjustment means including at least one shaft threadably mounted in a cylinder for selectively extend-

ing or retracting said stay upon relative rotation of said shaft and cylinder.

3,917,311

INVALID CARRIAGE

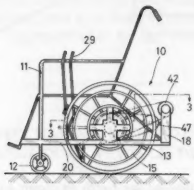
Sadae Wada, 3-1, Azateppoba, Odate, Akita, Japan

Filed Feb. 5, 1974, Ser. No. 439,962

Claims priority, application Japan, Feb. 5, 1973, 48-15065

Int. Cl.[2] **B62M** *25/04, 01/14;* **F16H** *03/38;* **F16D** *11/04*

U.S. Cl. 280—238 **8 Claims**



1. In an invalid carriage having a seat-carrying upright framework with an axle extending laterally across said framework, a pair of spaced driven wheels rotatably supported on said axle at both sides of said framework and a pair of spaced hand rims rotatably supported on said axle adjacent to said driven wheels for manually rotating said driven wheels, the improvement which comprises:

means for making a direct connection between said driven wheels and hand rims for simultaneous rotation therebetween;

reduction gear means having input shafts having means for coupling to said hand rims and output shafts having means for coupling to said drive wheels for positively reducing the rotation of said driven wheels with respect to said hand rims when said hand rims are connected to said driven wheels through said reduction gear means, said reduction gear means being independent of said direct connection means; and

clutch means for simultaneously actuating said direct connection means and disconnecting said reduction gear means or deactuating said direct connection means and connecting said reduction gear means,

whereby the use of the reduction gear means increases the force applied to the hand rims in ascending a slope and restrains acceleration of the carriage in descending a slope.

3,917,312

INDOOR/OUTDOOR WHEELCHAIR FRAME

Keith S. Rodaway, Culver City, Calif., assignor to Everst & Jennings, Inc., Los Angeles, Calif.

Filed July 29, 1974, Ser. No. 492,607

Int. Cl.[2] **B62M** *1/14*

U.S. Cl. 280—242 WC **4 Claims**

1. An indoor/outdoor wheelchair including in combination:

a. left and right generally C-shaped frames in spaced parallel, side-by-side relationship the free ends of the upper and lower arms of the C-shaped frames extending forwardly;

b. left and right main wheels rotatably mounted to the left and right rear base portions of the C-shaped frames respectively;

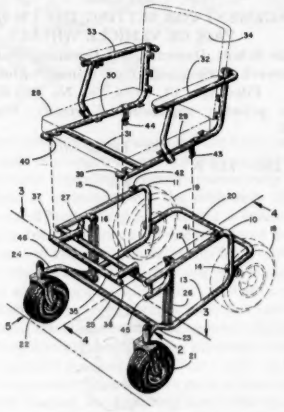
c. an horizontally transversely extending rear member connecting said base portions together;

d. left and right castor wheels rotatably mounted at the forward ends of the left and right lower arms of the C-shaped frames respectively;

e. an horizontally transversely extending forward cross member forward portions of said lower arms together;

f. a seat means including a chair frame defining seat and back areas supported by the upper left and right arms of said frames such that the seat means is effectively cantilevered from the rear base portions of the C-shaped frames; and

g. coupling means including a transverse open-ended tube mounted on the front portion of the upper arms of said C-shaped frames, first and second shorter tubes disposed in axial alignment within said transverse tube, spring means in the central portion of said transverse tube biasing the first and second shorter tubes apart so that their outer ends protrude from the open ends of said transverse tube, stop means limiting the outward extent of said shorter tubes, and first and second cylindrical receiving sockets at the forward end of said chair frame facing each other and dimensioned to receive the protruding ends of the first and second shorter tubes respectively so that said



chair frame is coupled to the C-shaped frames for swinging movement about a transverse horizontal axis whereby said chair frame may be completely decoupled from the C-shape frames by retracting said shorter tubes against the bias of said spring means to release said receiving sockets, and whereby a horizontal spacing between the front castor wheels is substantially maintained by said forward cross member while each castor wheel is substantially independently resiliently supported for up and down movement relative to said seat means as a consequence of the C-shaped configuration of the frames providing the ability of the forward portions of the lower arms to flex upwardly towards and downwardly away from the upper arms so that a cushioned ride for a person sitting in said seat means results when the wheelchair is used outdoors over uneven terrain.

3,917,313

MOTORCYCLE SUSPENSION SYSTEM

Fred W. Smith, West Bloomfield; Robert E. Jarman, Drayton Plains, and Russell L. Shreve, Troy, all of Mich., assignors to Bultaco, Compania Espanola Espanola De Motores, S.A., Barcelona, Spain

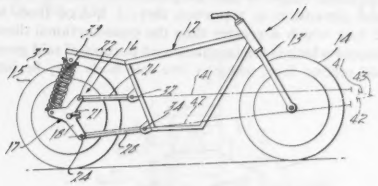
Filed Dec. 17, 1973, Ser. No. 425,104

Int. Cl.[2] **B62K** *25/20*

U.S. Cl. 280—284 **5 Claims**

1. In a motorcycle having a frame, a front wheel and a rear wheel, the improvement comprising a suspension system for suspending said rear wheel from said frame, said suspension system comprising a hub carrier for said rear wheel, a first link, a first pivotal connection between said first link and said frame, a second pivotal connection between said first link and said hub carrier, a second link, a third pivotal connection between said second link and said hub carrier, and a fourth

pivotal connection between said second link and said frame, said first, second, third and fourth pivotal connections being spaced from each other, said links being disposed at an angle



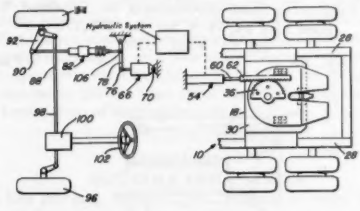
relative to each other and defining an instantaneous link center about which said links effectively pivot, said instant link center being disposed ahead of and above the axis of said front wheel when the motorcycle is in an unladened condition.

3,917,314

ANTI-JACKKNIFING FIFTH WHEEL ASSEMBLY

Gary R. Neal, Baltimore, Md., assignor to James E. Neal, Jr., Baltimore and Henry O. Hubich, Upperco, both of, Md., a part interest

Filed Mar. 22, 1974, Ser. No. 453,984
Int. Cl.² B62D *53/06*
U.S. Cl. 280—432 **10 Claims**



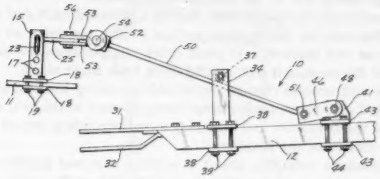
1. In combination, a tractor and a trailer pivotally coupled to the tractor for angular displacement relative thereto about an upstanding axis, drive means including a shiftable driver member interconnected between said tractor and trailer for controlling pivoting of the latter in response to shifting of the driver member, fluid pressure means, including control means therefor, operatively associated with said driver member for shifting the latter, said tractor including a shiftable steerable wheel control assembly and said control means including a shiftable actuator member, connecting means connecting said control assembly to said actuator member for shifting the latter in response to shifting of said steering control assembly, said control means further including means operative to control the shifting of said driver member in response to shifting of said actuator member to allow a change in the relatively angularly displaced positions of said tractor and trailer, other than slight relative pivotal movement, only to the relative positions which would normally be effected independent of said driver member if said steerable wheel control assembly was held in adjusted position and the tractor and trailer were moving forward with no side slippage of the wheels of the tractor and the trailer.

3,917,315

SAFETY HITCH

Loren C. Ostebee, and Lowell I. Howe, both of Rte. No. 1, Kirkman, Iowa 51447

Filed Sept. 13, 1974, Ser. No. 505,837
Int. Cl.² B60D *1/12*
U.S. Cl. 280—457 **3 Claims**



1. A trailer hitch assembly comprising:

a tongue member adapted to be connected to a trailing vehicle at one end thereof;

means at the other end of said tongue member for attaching said tongue member to a pulling vehicle including means pivotally mounting said tongue member for pivoting along a vertical axis;

lever means pivotally attached along a substantially horizontal axis to said tongue member;

a safety member being pivotally connected along a second substantially horizontal axis to said lever means;

means for attaching the other end of said safety means to the pulling vehicle, including a substantially vertical pivot and a substantially horizontal pivot, said vertical pivot lying substantially within the first said vertical axis; and

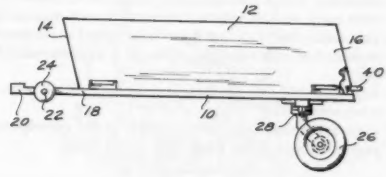
abutment means connected to the tongue member for limiting the pivotal movement of the safety member with respect to the tongue member, said safety member lying between the abutment means and the tongue member.

3,917,316

TRUNK STORING UTILITY TRAILER FOR AUTO

Richard P. Furnish, Cheyenne, Wyo., assignor to Raymond Lee Organization Inc., a part interest

Filed Oct. 3, 1974, Ser. No. 511,645
Int. Cl.² B60P *3/34*
U.S. Cl. 280—460 R **1 Claim**



1. A trailer adapted to be stored in the trunk compartment of an automobile when not in use and comprising:

a hollow container of rectangular shape open at the top and having a flat bottom horizontal surface with front and rear ends;

first and second parallel horizontally elongated members secured to the front end and extending longitudinally forward, said members having parallel horizontal top and bottom edges, the bottom edges being flush with the bottom surface of the container and having free ends disposed in front of the container;

first and second hitch members, each hitch member being secured to the free end of the corresponding elongated member;

first and second vertical wheels, each first and second wheel being rotatable about a horizontal axle secured to a corre-

sponding one of the elongated members and extending outward at right angles thereto, the topmost peripheral point on each of the first and second wheels being disposed above the top horizontal edge of the corresponding one of the elongated members, the bottommost peripheral point on each of the first and second wheels being disposed below the bottom horizontal edge of the corresponding one of the elongated members;

a horizontal elongated plate having a recess at each end and disposed on the bottom surface of the container at the rear end thereof, said plate extending between the sides of the container but spaced from both these sides;

first and second clamps detachably securing said plate to said container, each clamp being secured to the rear end of the container and engaging a corresponding one of the recesses of the plate; and

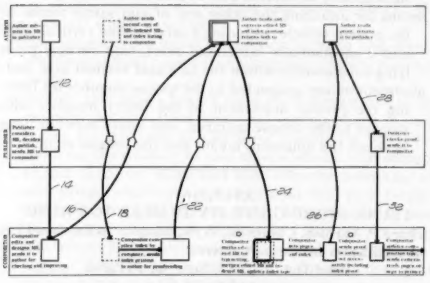
a structure rotatable about a vertical axis and secured to said plate, said structure extending below the plate and including a vertical wheel rotatable about a horizontal axis.

3,917,317

BOOK INDEXING AND PROCESSING SYSTEM

Vincent J. Ryan, Van Nuys, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Feb. 25, 1974, Ser. No. 445,516
Int. Cl.[2] B42F *21/00*
U.S. Cl. 283—42 **4 Claims**



1. In a book manufacturing process the method of compiling a final index from manuscript, comprising the steps of:

a. encoding with a corresponding consecutive index-indicia code each item of indexed material in said manuscript;

b. processing said indexed material and said corresponding consecutive index-indicia codes in a predetermined order;

c. inputting said index-indicia codes concurrently with said manuscript; and

d. converting said index-indicia codes to the corresponding page numbers of the final copy of the book.

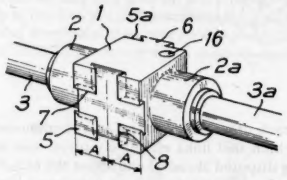
3,917,318

MODULAR COUPLING

Andre Legris, St-Maur, France, assignor to Societe Legris France S.A., Ozoir-la-Ferriere, France

Filed June 28, 1974, Ser. No. 484,246
Claims priority, application France, July 3, 1973, 73.24471
Int. Cl.[2] F16L *35/00*
U.S. Cl. 285—18 **11 Claims**

1. A pipe coupling for interconnecting a pair of pipes for fluid flow from one of said pipes to the other of said pipes, said coupling comprising a body having first and second faces which face in opposite directions and having at least two other faces which face in directions different from said directions, said first face having at least one projection thereon extending transversely thereof, said projection having a cross-sectional dimension at a portion thereof spaced from said first face which is greater than the cross-sectional dimension of said projection intermediate said portion and said first face, said second face having at least a first groove and a second groove therein extending transversely of said second face and intersecting at an angle to each other, each said first and second groove having a cross-sectional shape which matches the cross-sectional shape of said projection and having a cross-sectional dimension at a portion thereof spaced from said second face which is greater than the cross-sectional dimension thereof which is intermediate said portion of said groove and said second face, whereby one said body may be inter-



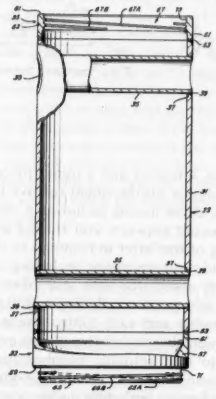
located with another said body by slidably inserting said projection of said one body in a said groove of said other body, said first-mentioned body also having a pair of pipe receiving openings therein, one of said openings being in one of said two other faces and the other of said openings being in one of said two other faces, and having a fluid passageway interiorly thereof extending from said one of said openings to said other of said openings for the passage of fluid therebetween, and means at each of said openings for securing a pipe to said body.

3,917,319

BOX HOLE DRILL STEEL

Joseph A. Kloesel, Jr., and Otis Ned Rodgers, both of Midland, Tex., assignors to Smith International, Inc., Midland, Tex.

Filed June 14, 1974, Ser. No. 479,270
Int. Cl.[2] F16L *55/00*
U.S. Cl. 285—39 **4 Claims**

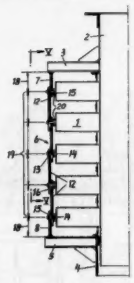


1. Box hole drill steel comprising a tubular body having rotary shouldered connections at its ends and holding tubes extending transversely across the body adjacent to its ends, said connections including multiple lead modified buttress threads of less than 360° extend and having a break out torque less than make up torque, the steel having a length of the order of 1 yard plus or minus 50 percent with a circumference to length ratio greater than unity.

3,917,320
EXPANSION JOINT

Wilfried Grosse-Allermann, Bottrop, Germany, assignor to Babcock & Wilcox, Limited, London, England

Filed Jan. 18, 1974, Ser. No. 434,462
Int. Cl.² F16L *13/04*
U.S. Cl. 285—114 **2 Claims**



1. A support system for an expansion joint comprised of a plurality of serially connected expandable folds, a stationary frame connected at one end of the expansion joint and a movable frame connected at the opposite end thereof, a chain extending between the frames and including a plurality of intermediate links and a pair of terminal links, the intermediate links having overlapping ends and the terminal links having one end overlapping the adjacent intermediate link, means connecting the other end of each of said terminal links to the frame adjacent thereto, wherein each end of each pair of overlapping ends is disposed opposite one of the folds and formed with an opening, said openings being in substantial alignment, and wherein at least one of the openings is elongated, a pin stud extending through said aligned openings to slideably interconnect the overlapping ends, and means connecting the pin stud to a corresponding fold and wherein said elongated opening of each pair of overlapping ends is closed at its opposite ends which limits the relative movement of its corresponding pin stud and links thereby limiting expansion and contraction of said joint.

3,917,321
BOX HOLE DRILL STEEL

Otis Ned Rodgers, Midland, Tex., assignor to Smith International, Inc., Midland, Tex.

Filed June 14, 1974, Ser. No. 479,307
Int. Cl.² F16L *55/00*
U.S. Cl. 285—115 **7 Claims**

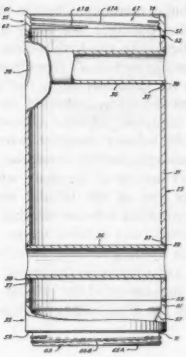
1. Threaded connection adapted for repeated make up and break out during use comprising

a pin tool joint of generally tubular configuration including an annular shoulder and a pin extending away from the shoulder, the pin including an unthreaded portion adjacent the shoulder and a threaded portion adjacent said unthreaded portion and axially away from said shoulder, and

a box tool joint of generally tubular configuration including an annular shoulder and a box extending away from said shoulder, the box including an unthreaded portion adjacent the last said shoulder and a threaded portion adjacent the last said unthreaded portion and axially inward from said shoulder,

the box threaded portion being adapted to engage the pin threaded portion and said shoulders being adapted to engage when said threaded portions are made up, said tool joints being made of elastic metal such as steel whereby final makeup of the threaded portions axially stresses said unthreaded portions, one in tension and the other in compression,

said threaded portions each having double lead helical threads each of greater than 180° but less than 360° extent leaving a circumferential gap in each thread, the gaps being disposed 180° apart, the gap in one thread on each portion having the same azimuthal position as the



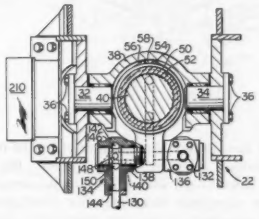
mid part of the other thread of that same threaded portion, the taper of said threads being zero plus or minus ½ inch per foot,

whereby said connection is adapted for fast make-up and break-out yet is stable in resisting relative canting of the pin and box tool joints when made up.

3,917,322
JOINT STRUCTURE FOR CLAMSHELL BUCKET ASSEMBLY

Lawrance F. Berg, Lockport; Theodore B. Hogg, Aurora, and Robert W. Lichti, Oswego, all of Ill., assignors to Caterpillar Tractor Company, Peoria, Ill.

Division of Ser. No. 283,818, Aug. 25, 1972, Pat. No. 3,873,133. This application Mar. 29, 1974, Ser. No. 456,241
Int. Cl.² F16L *39/04*; **E02F** *3/44*
U.S. Cl. 285—136 **3 Claims**



1. A joint assembly comprising: a tubular member generally fixed in position and defining a longitudinal bore and a lateral tubular member passage through the body thereof; a longitudinal shaft disposed within the bore of the tubular member with the outer surface thereof in intimate relation with the inner surface of the tubular member and rotatable about its longitudinal axis within the tubular member, and defining through the shaft body a shaft passage; and, an annular passage defined between the inner surface of the tubular member and the outer surface of the shaft, providing continuous communication therethrough of the tubular member passage and the shaft passage, irrespective of the rotative position of the shaft relative to the tubular member, wherein the tubular member defines through the tubular member body thereof a

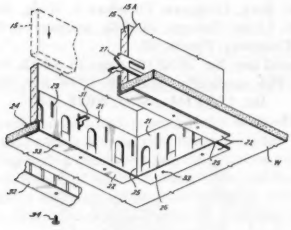
second lateral tubular member passage, the shaft defining through the shaft body thereof a second shaft passage, and further comprising a second annular passage defined between the inner surface of the tubular member and the outer surface of the shaft, providing continuous communication therethrough of the second tubular member passage and second shaft passage, irrespective of the rotative position of the shaft relative to the tubular member, wherein the first-mentioned and second annular passages are each disposed in planes generally perpendicular to the longitudinal axis of the shaft, and wherein are further included a fixed frame associated with the joint assembly for generally fixing the tubular member in position relative to the frame, wherein the first and second annular passages comprise annular channels formed in the inner surface of the tubular member, wherein the first and second annular passages further comprise annular channels formed in the outer surface of the shaft, wherein the frame is disposed on either end of the tubular member to allow a degree of movement of the tubular member along the longitudinal axis of the shaft, and relative to the shaft, and further including means for limiting rotative movement of the tubular member about its axis relative to the frame, meanwhile allowing said degree of movement of the tubular member along the longitudinal axis of the shaft and relative to the shaft.

3,917,323

CONNECTING APPARATUS FOR AN AIR DUCT SYSTEM

John P. Morgan, 10810 Algonquin, Apt. 406, Houston, Tex. 77034

Filed Sept. 12, 1973, Ser. No. 396,502
Int. Cl.[2] F16L *5/02, 41/00*
U.S. Cl. 285—189 **18 Claims**



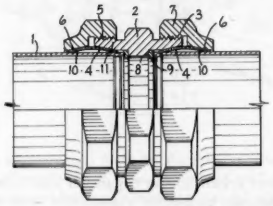
1. In an air flow system having a duct board member connected to another member of the system, the connection between said duct board member and said another member comprising an elongated strip member overlapped with the inside of said members to provide connection therebetween, said strip member including a plurality of spaced openings adjacent said duct board member and means connecting said strip member to said another member adjacent said another member; and a plurality of blind fasteners separate from said strip member with one of said blind fasteners being provided in each of at least a substantial number of said spaced openings to provide connection between said duct member and said strip member, each of said blind fasteners being a pull tie comprising an enlarged head portion lying substantially against the outside of said duct board member, and a tail portion extending from said head portion through said duct board member and one of said spaced openings, said tail portion being laterally enlarged adjacent said strip member to prevent passage through said opening in the direction of original insertion.

3,917,324

PIPE JOINT

Hiroe Wakatsuki, and Toshio Nishimura, both of Tokyo, Japan, assignors to Toyo Kinzoku Corporation, Tokyo, Japan

Filed Oct. 17, 1974, Ser. No. 515,722
Claims priority, application Japan, Apr. 19, 1974, 49-43290; Aug. 19, 1974, 49-98860[U]
Int. Cl.[2] F16L *17/00*
U.S. Cl. 285—341 **5 Claims**

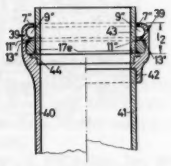


1. A pipe joint, comprising: a metal pipe having an unthreaded end; a metal body member having a tubular socket for receiving said unthreaded end of said metal pipe, said tubular socket having an internal shoulder at its inner end and an annular, resilient, compressible packing ring seated on said shoulder and sealingly engaged with said one of said metal pipe, said tubular socket being defined by an annular axially extending flange projecting away from said shoulder and encircling said end of said pipe, said flange having a threaded portion on its external wall, the internal wall of said flange consisting of an axially outer portion which tapers in a direction from the axially outer end of said flange partway toward said shoulder and an axially inner portion which extends from the inner end of said outer portion to said shoulder, said axially inner portion of said internal wall being of substantially uniform diameter throughout its length and being disposed in surrounding and radially outwardly spaced relationship to said pipe; a metal nut sleeved on said pipe and having a threaded first internal wall portion threadedly engaged with said threaded portion of said flange and a tapered second internal wall portion spaced axially outwardly from said first internal wall portion and tapering in an axially outward direction; a thin-wall, flat, metal packing sleeve surrounding said pipe and having the opposite end portions of its external surface in surface-to-surface contact with said tapered second internal wall portion of said nut and said tapered axially outer portion of the internal wall of said flange, said sleeve being concavo-convex in axial cross-section and having its opposite axial ends plastically deformed and pressed against the exterior surface of the pipe along two axially spaced circumferentially extending lines of contact with the interior surface of said pipe being free from internal support at said lines of contact, other portions of said sleeve being elastically deformed so that the sleeve can elastically spring back when said nut is unthreaded from said body member, the inner axial end of said sleeve extending inwardly beyond the inner end of said axially outer portion of the internal wall of said flange and into the space between said axially inner portion of the internal wall of said flange and said pipe, the edge of said inner axial end of said sleeve biting into and forming an annular groove in the exterior surface of said pipe.

3,917,325
JOINTS FOR PIPES IN A SOCKET

Max Mengeringhausen, Wurzburg, Germany, assignor to Mero A.G., Zug, Switzerland

Filed Oct. 9, 1973, Ser. No. 404,670
Claims priority, application Germany, Oct. 9, 1972, 2249455
Int. Cl.[2] F16L *17/02*
U.S. Cl. 285—344 10 Claims



1. In a join for a pipe in a socket wherein at least one sealing ring is detachably disposed near the socket entrance in an inner annular readiness space, the inside diameter of said sealing ring being smaller than the outside diameter of the pipe, a socket wall constriction is disposed adjacent to and inwardly of said inner annular readiness space, a second inner annular space is disposed inwardly of the wall constriction, as sealing ring space, and the spigot end of a pipe is inserted into the socket such that the sealing ring snaps and partially expands, said sealing ring being rolled out of the first inner annular space by frictional entrainment and being compressed by the socket wall constriction, the improvement wherein the inside diameter (D4) of said sealing ring space is approximately the same as the inside diameter (D5) of said readiness space, directly behind and closely adjacent to the sealing ring space (**13, 14, 13′, 13″, 130, 130′**) an abutment (**15, 15′, 15*a*, 15*b***) with an elastic sealing surface for the spigot end of the pipe is provided, and the socket wall constriction comprises a compression collar (**11, 12, 11′, 11″, 110, 110′**) for the sealing ring (**17, 17*c***) whose axial cross-sectional width is smaller than the cross-sectional diameter of the sealing ring, the spigot end of the pipe being inserted in the socket into engagement with said elastic abutment surface, whereby the sealing ring rolls over the compression collar suddenly with creation of an axial shock component and, after its partial expansion into the second sealing ring space, is pressed against a peripheral region of the compression collar away from the abutment by the counter-pressure produced by the elastic abutment surface on the spigot end.

3,917,326
INDUCED RECOVERY OF PARTICLES FROM SUB-SURFACE FORMATIONS

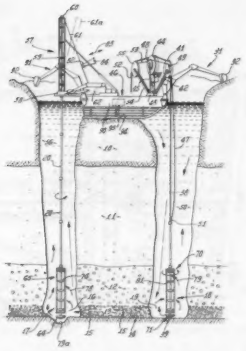
Donovan B. Grable, Long Beach, Calif., assignor to Wasteland Reclamation Corporation, Long Beach, Calif.

Filed Nov. 12, 1973, Ser. No. 414,818
Int. Cl.[2] E21C *41/14*
U.S. Cl. 299—8 27 Claims

1. In the recovering of metallic particles from a subsurface formation, the process that includes

a. rotatably cutting downwardly into the sub-surface formation to at least one of two spaced sub-surface localities and producing a flow of liquid in the sub-surface formation extending between said spaced sub-surface localities, and sufficient to displace metallic particles from within the formation to one of said localities, and

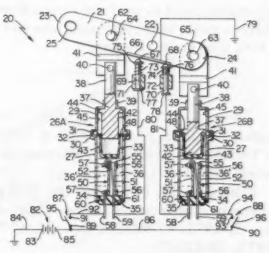
b. retrieving metallic particles displaced to said one locality, said retrieving step including separating at said one locality said metallic particles from loose non-metallic material and also effecting flow of liquid with metallic particles carried therein in a stream upwardly to the surface.



3,917,327
THERMALLY ACTUATED DEVICE AND DOOR LATCH MEANS UTILIZING THE SAME OR THE LIKE

Emil Robert Plasko, Washington Township, Ohio, assignor to Micro Devices Corp., Dayton, Ohio

Filed Feb. 5, 1974, Ser. No. 440,159
Int. Cl.[2] E05C *19/16*
U.S. Cl. 292—1 15 Claims



1. In a thermally actuated device comprising a housing means having a chamber provided with a thermally responsive means and being defined in part by a motion transmitting member movable relative to said housing means in response to expansion or contraction of said thermally responsive means, the improvement of an electrical heater means disposed in said chamber for heating said thermally responsive means when said heater is energized, said heater providing substantially a uniform thermal flux to said thermally responsive means throughout substantially the entire surface area of said heater, said heater comprising a member of electrical insulating material having a conductive coating on the exterior surface thereof that provides an electrical resistance heater means when electrical current passes through the same.

3,917,328

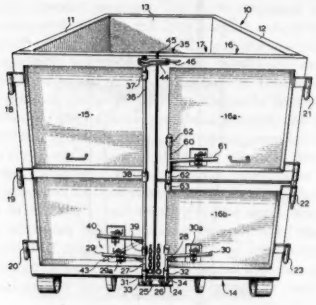
CONTAINER CLOSURE FASTENING MEANS

Quinto De Filippi, 21 Chauncey Ave., Toronto, Canada

Filed Feb. 28, 1974, Ser. No. 447,014

Int. Cl.²·E05C *9/08*

U.S. Cl. 292—7 **7 Claims**



1. Fastening means for use with a pair of doors hingeably opening away from one another, wherein each of said doors has a hinged side and an oppositely disposed free edge, said free edges meeting when said doors are closed, said fastening means comprising;

a hook member fixed adjacent to the free edge of one of said pair of doors, and directed away from said free edge of said door;

camming surface means between said hook member and the free edge of said door;

rod means rotatably attached adjacent the free edge of the other of said doors;

an eye means for engaging said hook member swingably mounted on said rod means in registration with said hook member and moveable between hook engaging and disengaging positions;

pin means on said eye means oriented to engage said camming surface means for procuring swinging movement of said eye means relative to said hook means, and,

operating means fixed to said rod means to rotate the same and thereby move said eye means into and out of engagement with said hook member.

3,917,329

LOCK

Masaru Fujiki; Masahiro Yoshida, both of Tokyo, and Hiroshi Fukuda, Yoshikawa, all of Japan, assignors to Pioneer Audio Corporation, Japan

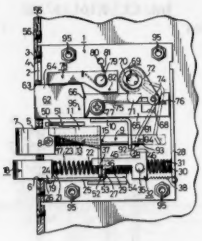
Filed July 30, 1973, Ser. No. 383,492

Claims priority, application Japan, July 31, 1972, 47-90235; Aug. 5, 1972, 47-92358; Oct. 24, 1972, 47-122710; Apr. 14, 1973, 48-42547

Int. Cl.² E05C *1/08*

U.S. Cl. 292—163 **8 Claims**

1. A lock for latching a door, comprising in combination: a casing; a latch bolt and a working member reciprocatably supported by the casing and movable between a projected position wherein said latch bolt projects from said casing for latching the door and a retracted position wherein said latch bolt is retracted into said casing; an interlocking member having one end connected to the latch bolt and another end located on a line of action of the working member; latch spring means disposed between the interlocking member and the latch bolt and coacting with said interlocking member to bias the latch bolt in the direction of its projection; spring means for retracting the latch bolt and being interconnected between said another end of said interlocking member and the working member; trigger means for releasably blocking movement of the interlocking member in such a manner that a certain repulsive force is accumulated in said spring means for retracting the latch bolt as the working member is retracted when the door is closed, and upon releasing of the interlocking member, effecting release of the spring means for retracting



the latch bolt so as to move the latch bolt to its retracted position; and another spring means disposed between the working member and the casing and operable when the door is opened to return the latch bolt and the working member to the projected position.

3,917,330

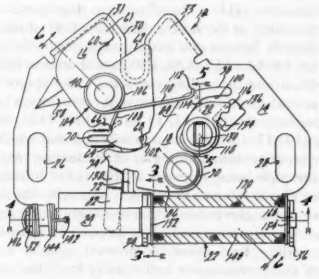
ELECTRIC LOCK RELEASE

Norman G. Quantz, Algonac, Mich., assignor to Lectron Products, Inc., Troy, Mich.

Continuation of Ser. No. 256,990, May 25, 1972, abandoned. This application Jan. 25, 1974, Ser. No. 436,620

Int. Cl.² E05C *3/26*

U.S. Cl. 292—216 **15 Claims**



1. A locking mechanism for an automoative deck lid comprising:

a housing;

a latch element pivotably supported by said housing and having first and second positions for respectively releasing and securing the deck lid;

bias means for urging said latch element toward said first position;

a detent element pivotably supported by said housing and operable in one position thereof to retain said latch element in said second position;

cooperable shoulder and finger means associated with said latch and detent elements respectively for retaining and releasing said latch element relative to said second position,

said shoulder means provided with a concave seat having a radius of curvature substantially equal to the radius of rotation of said finger means;

wedging means coactive with said finger means for urging said latch element toward said first position.

said wedging means comprising a relatively small convex and reversely curved portion formed on a radius of curvature tangentially connected to the radius of curvature of said seat at one end thereof and defining a crown therewith;

stop means on said latch element at the end of said concave seat opposite said crown engageable with said detent element to precisely locate said finger means on said seat proximate said crown when said latch is in said second position; and

actuator means including a plunger coactive with said detent element and operable to move the latter to release said latch element.

3,917,331

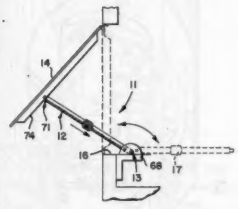
ROTATABLE LOCKING MECHANISM HAVING MOVABLE DETENTS

John A. Duran, Glendora, Calif., assignor to Avibank Mfg. Inc., Burbank, Calif.

Filed Jan. 4, 1974, Ser. No. 430,725

Int. Cl.² E05C *17/04*

U.S. Cl. 292—338 **15 Claims**



1. A releasable detent locking mechanism with rotatable movement, comprising:

first and second pivotally connected members having closely confronting wall portions which undergo relative rotational movement while maintaining substantially constant clearance therebetween;

an elongate spindle receiving bore means provided in said first member and extending adjacent to and inwardly of the associated wall portion;

at least one transverse detent receiving opening means extending in said first member between said associated wall portion and said bore;

spindle release means mounted for axial movement in said bore means;

movable detent means disposed in said detent receiving opening means for cooperative movement of said detent means by said spindle release means between protruding and retracted positions relative to said first member wall portion; and

locking indent means provided in said second member wall portion confronting said first member wall portion and being positioned in the rotational path of said detent means for cooperating with said detent means in its protruding position to lock said members against the otherwise relative rotatability therebetween, whereby said detent means may be displaced between its protruding and retracted positions by said spindle means to lock or release the relative rotatability of said members respectively.

3,917,332

VEHICLE FENDERS OF RESILIENT MATERIAL

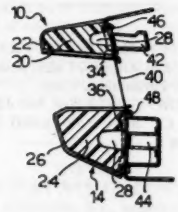
Guiseppe Puleo, Turin, Italy, assignor to Fiat Societa Per Azioni, Turin, Italy

Filed June 19, 1974, Ser. No. 480,765

Claims priority, application Italy, June 25, 1973, 68884/73

Int. Cl.² B60R *19/08*

U.S. Cl. 293—63 **3 Claims**



1. Resilient fender for motor vehicles comprising at least one element of porous elastomeric material, in particular expanded polyurethane foam, having a flexible covering and an internal reinforcement, the fender being arranged transversely on an end surface of the motor vehicle, wherein the improvement resides in the said element having:

a. means defining a plurality of individual, spaced apart cavities of substantially ogival form with their axes directed substantially parallel to the longitudinal plane of symmetry of the vehicle, and with their bases disposed in the surface of the element which faces the motor vehicle body in the installed position of the fender and

b. means defining a plurality of through channels adjacent the lights of the vehicle which traverse the element over its entire height on the surface of the latter which faces towards the vehicle body in the installed position of the fender.

3,917,333

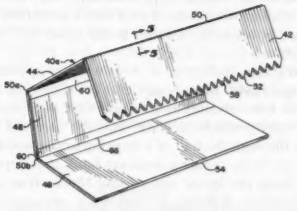
SANITARY SCOOP

Donald J. Grattan, 5929 N. Artesian, Chicago, Ill. 60645

Filed Mar. 15, 1973, Ser. No. 341,358

Int. Cl.² A47L *13/52*

U.S. Cl. 294—1 R **7 Claims**



3. A disposable hand-operated waste material scoop adapted to form a flat folded package comprising:

a series of four generally planar elongated wall members;

said wall members being foldable along their contiguous edges thereby defining a central fold line between an intermediate pair of wall members and two remaining fold lines in parallel relationship therewith connecting an endmost pair of wall members;

the intermediate pair of said wall members being foldable by hand pressure along said central fold line to form a gradually diminishing inner apex;

the endmost pair of said wall members being simultaneously foldable by hand pressure along the remaining fold lines toward said inner apex with the outer edge of one of said

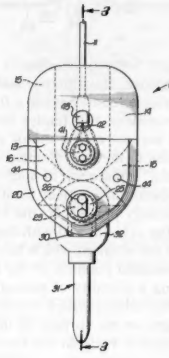
endmost wall members contacting the inner face of the other of said endmost wall members in a scraping action; the effective folded width of said endmost pair of said wall members being less than the effective folded width of said intermediate wall members whereby the respective outer edges of said endmost pair of wall members slide into said apex in its closed position with said four wall members defining said folded flat package.

3,917,334

SNATCH BLOCK FOR CRANES

Aloysius J. Koster, Los Angeles, Calif., assignor to SSP Truck Equipment, Inc., Paramount, Calif.

Filed Dec. 3, 1973, Ser. No. 421,036
Int. Cl.[2] B66C *1/00*; B66D *1/36*
U.S. Cl. 294—82 R **8 Claims**



1. A snatch block, comprising:

block structure having upper and lower ends and a vertical centerline, said structure having a plurality of horizontally extending vertically spaced apart bores defined therethrough which extend through said vertical centerline, a first one of said bores being located adjacent the lower end of said block structure, a second one of said bores being located approximately midway between the upper and lower ends of said block structure, a third one of said bores being located in the upper half of said block structure;

said structure defining a downwardly opening centrally located cavity in its lower end for receiving the bail of a swivel type hoisting hook, said first bore traversing said first cavity whereby a pin may be inserted in said first bore through the bail of a hoisting hook positioned in said first cavity to secure a hoisting hook in a depending position from the lower end of said block structure;

said structure defining an upwardly opening centrally located cavity which extends upwardly from a selected point in the lower half of said block structure, said second and third bores traversing at least portions of said second cavity whereby a pin may be inserted in either said second or third bores for use in suspending the upper end of said block structure from a hoisting cable extending downwardly into said second cavity;

said block structure being comprised of a plurality of plates of predetermined thicknesses and weights held apart by spacer means, said plates being clampable together by pins of appropriate length pinned through selected ones of said bores;

said plurality of plates being made up of two similar groups which are held apart by said spacer means;

said spacer means being two similar spacers for positioning adjacent opposite side edges of said plates; and

each of said plate groups being comprised of a side plate, sheave plate and liner plate, said side plate being for positioning outermost, said liner plate being for positioning innermost, said sheave plate being for positioning between said side and liner plates,

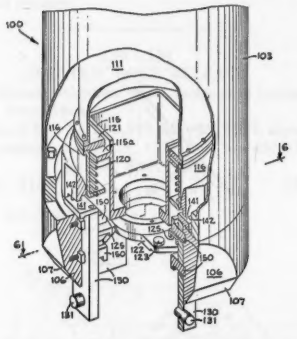
said side plates being approximately one-half as long as said sheave plates, said liner plates being slightly shorter than said sheave plates, and said plates being assembled with the lower ends of said side and sheave plates being flush and the lower ends of said liner plates being positioned slightly above the lower ends of said sheave plates.

3,917,335

FUEL ASSEMBLIES, GRAPPLES THEREFOR AND FUEL TRANSPORT APPARATUS FOR NUCLEAR REACTOR POWER PLANT

Cecil R. Jones, Milford, Conn., assignor to Transfer Systems Incorporated, North Haven, Conn.

Division of Ser. No. 220,751, Jan. 26, 1972, Pat. No. 3,802,996, which is a continuation-in-part of Ser. No. 178,175, Sept. 7, 1971, Pat. No. 3,823,065. This application May 25, 1973, Ser. No. 363,945
Int. Cl. B66c *1/62*
U.S. Cl. 294—84 A **7 Claims**



1. A grapple for use with a nuclear reactor comprising an outer tube, depending lifting members mounted for horizontal sliding movement on the outer tube walls and extending within the outer tube, means mounted within the outer tube for rotary movement therein about the outer tube vertical axis, means connecting the means for rotary movement to the lifting members for converting the rotary motion into lateral movement of the lifting members, and means for inhibiting lateral movement of the lifting members whenever load is applied thereto.

3,917,336

GLASS HANDLING TONGS

Joe Y. Sawai, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Aug. 2, 1974, Ser. No. 494,268
Int. Cl.[2] B66C *1/48*
U.S. Cl. 294—118 **2 Claims**

1. Glass handling tongs which comprise:

a first clamping member and a second clamping member, each of said clamping members having a central leg, a depending clamping leg, and an extending support leg, said clamping leg and said support leg extending in generally opposite directions from opposite ends of said central legs;

a pivot pin securing said clamping members together at a location on said central legs of said clamping members adjacent said clamping legs thereof, whereby said clamping legs are in spaced relationship;

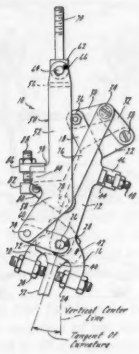
a pair of links connected at one end to each other and at the other end respectively to one of said support legs of said clamping members whereby movement of said links open and closes said clamping leg of said clamping members;

a support frame including a pair of side members joined at the top by a cross member, each of said side members having a downwardly extending leg and an angularly extending leg joined to the lower part of said downwardly extending leg at a junction portion;

structure means for mounting said support frame in a vertical plane;

a pair of lower links;

first pivot connection means for pivotally securing one end of each of said lower links to the free end of one of said



angularly extending legs of said side members of said support frame, the other end of each of said links being pivotally connected to said pivot pin securing said clamping members together;

a pair of upper links;

second pivot connection means for pivotally securing one end of each of said upper links to said junction portion of respective ones of said downwardly extending legs of said side members of said support frame, the other end of each of said upper links being pivotally connected to the interconnection of said pair of links whereby said support legs of said clamping members are pivotable between a vertically aligned position and an angularly aligned position with respect to said support frame.

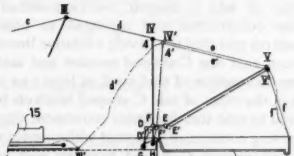
3,917,337

FOLDING TENT TRAILER

Albert Couix, 4, rue Labatie, 07300 Tournon, France

Filed Feb. 8, 1973, Ser. No. 330,738
Claims priority, application France, Sept. 5, 1972, 72.32060
Int. Cl.² B60P *3/34*
U.S. Cl. 296—23 A **5 Claims**

PL. IV–10



1. In a folding tent trailer having a box provided with at least one hinged cover member and containing a tent and a plurality of arch members pivotally supported by said box to swing upwardly therefrom and having tent engaging portions to hold said tent in erected condition, the improvement comprising:

a pair of links which are generally parallel in all positions thereof pivoted to the sides of said box on longitudinally spaced apart axes for upward swinging movement;

a lever pivoted to each of said links at pivot points fixed on said links and spaced upwardly from said axes, and lever having an end portion thereof extending laterally of one link in a direction away from the other link;

at least one end of one of said arch members being pivoted to said end portion of said lever; and

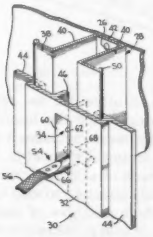
means connected to said cover and responsive to swinging movement thereof to swing said links about their axes and thereby project said at least one arch member upwardly to tighten said tent.

3,917,338

COMBINED POST AND TIE-DOWN ANCHOR

Robert L. Becker, Louisville, Ky., assignor to Dealers Truck Equipment Inc., Louisville, Ky.

Filed Apr. 2, 1974, Ser. No. 457,210
Int. Cl.² B60J *5/06*
U.S. Cl. 296—28 M **5 Claims**



1. A post and tie-down anchor assembly adapted to receive a tie-down fastener and to support a permanent wall of a cargo container or the like comprising a channel shaped support post having a pair of oppositely directed flanges on the lateral edges thereof, an elongated anchor plate extending for substantially the full length of said support post, said anchor plate having a central portion and longitudinally extending grooves adjacent thereto for slidingly engaging said flanges, the central portion of said plate overlying the open space in said channel, means for retaining said anchor plate in substantially fixed relationship with respect to the full length of said post in the longitudinal direction, and means on said central portion of said anchor plate for attaching said tie-down fasteners, whereby increased strength and centered tie-down capability are provided.

3,917,339

IMPACT ENERGY ABSORBING SYSTEM FOR A ROW OF VEHICLE SEATS

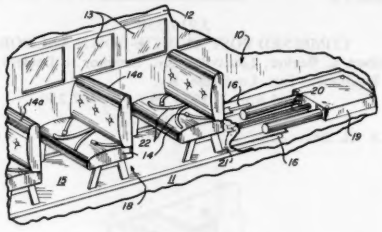
Fred W. Fritz, 1485 S. Vrain Way, Denver, Colo. 80219

Filed June 17, 1974, Ser. No. 480,121
Int. Cl.² B60N *1/08*
U.S. Cl. 296—65 A **6 Claims**

1. An energy absorbing system for controlling the deceleration movement of a longitudinal row of interconnected seats in a vehicle should the vehicle be subjected to a longitudinal impact force wherein said row of seats is mounted on slidable guide means arranged so that the seats will slide, longitudinally, in a fore and aft direction with respect to said vehicle and an energy absorbing means having a fixed component mounted on the vehicle and a movable component attached to said row of seats to attenuate any movement of said row of seats resulting from a sudden acceleration movement of the vehicle as when the vehicle is subjected to an impact so as to

cushion the impact force transferred to passengers occupying said seats, the improvement comprising in the combination set forth:

a. a plurality of compression springs between the fixed component and the movable component of the energy absorbing device, with at least one spring having a length such as to resist any movement between the said components and at least one shorter spring having a length such as to resist movement between the components only after the first mentioned component has been compressed to a substantial degree by movement between the two components whereby to increase the resistance to further movement between the components to a degree exceeding the resistance by continued compression of the first mentioned spring; and



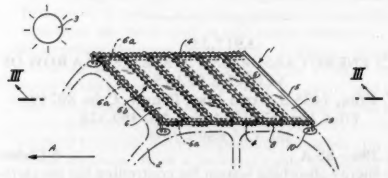
b. damper means to attenuate the rebound effect of the compressed springs after the impact force terminates; said slidable guide means includes a pair of parallel guide rails which are arranged parallel to the longitudinal axis of the vehicle, each of said guide rails includes a stationary section fixedly attached to said vehicle and a slidable section upon which said row of seats are mounted, the slidable portion of said guide rails being positioned above the stationary portion and having longitudinal side edges turn downward and under the edges of said stationary sections to maintain the relative position of the sections and prevent dirt and debris from entering the area between said sections which could retard the slidable movement of said seats.

3,917,340

SHADE

Everardo Machuca Aguirre, Cocateros 211, Co. Nueva Santa Maria, Mexico 16, D.F.

Filed Oct. 15, 1974, Ser. No. 514,919
Claims priority, application Mexico, June 11, 1974, 151777
Int. Cl.[2] B60J 7/10
U.S. Cl. 296—137 R **9 Claims**



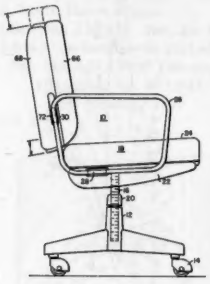
1. A shade for shading mobile vehicles or the like from the rays of the sun comprising a support structure provided on the roof of said vehicle, said structure having a plurality of transversely spaced elongated members and a plurality of cross-tie members connected to and spaced along said elongated members; and a plurality of sheet material pieces accommodated on said support structure, each having a first portion attached to said elongated members and to one of said cross-tie members, and a second portion which is unattached to said support structure, so that each of said sheet material pieces forms a passage for air moving opposite to the direction of motion to pass through when said vehicle is in motion.

3,917,341

CHAIR BACK HEIGHT ADJUSTMENT MECHANISM

Don C. Albinson, Coopersburg, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 28, 1974, Ser. No. 473,951
Int. Cl.[2] A47C 7/40
U.S. Cl. 297—353 **1 Claim**

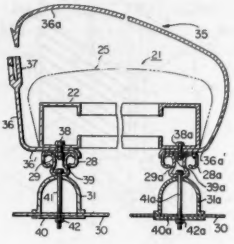


1. A chair comprising, in combination:
a base portion,
a seat portion mounted on said base portion,
a pair of back mounting arms extending from said base portion on either side of said seat portion,
a chair back including a structural chair back member completely enclosed within said chair back,
a back support member extending through openings in the sides of said chair back and connected between said back mounting arms,
a first C-shaped bracket secured to said back support member having a pair of vertically aligned apertures, one in each of the horizontally extending arms thereof,
a second C-shaped bracket secured to the structural chair back member and facing in an opposed relationship to said first C-shaped bracket, said second C-shaped bracket also including a pair of vertically aligned apertures, one in each of the horizontally extending arms thereof, and
an at least partially threaded stud including at one end thereof tool receiving means whereby rotation may be imparted to said stud, said stud extending through each of said vertically aligned apertures in both said first and said second C-shaped brackets, at least one of said apertures in one of said C-shaped brackets including threads therein constructed and arranged to coact with the threads on said stud to provide a relative linear movement between said one C-shaped bracket and said stud in response to rotation of said stud, at least one of said apertures in the other of said C-shaped brackets being loosely secured to said stud for linear movement therewith while permitting rotation of said stud with respect thereto, said first and second C-shaped brackets and said partially threaded stud being completely enclosed within said chair back and said chair back including an aperture in the bottom edge thereof to provide access to said tool receiving means on said stud.

3,917,342
VEHICLE SEAT AND SAFETY HARNESS ASSEMBLY

Tetuziro Furuta, Yokohama, Japan, assignor to Nissan Motor Company Limited, Yokohama, Japan

Filed Oct. 25, 1973, Ser. No. 409,680
Claims priority, application Japan, Oct. 26, 1972, 47-123774
Int. Cl.² A62B 35/00
U.S. Cl. 297—385 2 Claims



1. In a safety harness assembly for use with a vehicle seat including a seat portion and a seat back portion and carried by a seat adjuster constituted by a pair of guide rails fixedly mounted on a floor of the vehicle and a pair of elongated sliding members fixedly connected to the lower portion of said seat and slidably riding on said guide rails respectively, the improvement comprising:

a seat belt having one end firmly held between one of the seat portion frames and one of the sliding members,

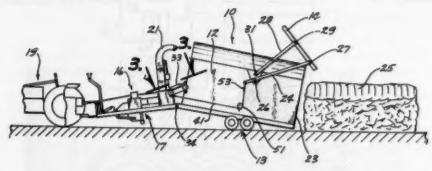
an upwardly elongated resilient member having its lower end firmly held to the other sliding member, an intermediate member made of an elastic material and disposed between said lower end and a belt engaging portion of said resilient member, said resilient member lying adjacent one side of said seat portion and having substantially the same height as said seat portion, and

first and second connecting means for respectively connecting the one end of said seat belt to one of said sliding members and the lower end of said upwardly elongated resilient member to said other sliding member.

3,917,343
DOOR APPARATUS AND ACTUATOR FOR A CROP GATHERING MACHINE

Howard W. Taylor, and Richard C. Pedersen, both of Grinnell, Iowa, assignors to Farmhand, Inc., Grinnell, Iowa

Filed Mar. 18, 1974, Ser. No. 451,943
Int. Cl.² B65G 67/30
U.S. Cl. 298—23 DF 19 Claims



1. A door actuating apparatus for a crop gathering machine comprising:

a first frame;

a housing attached to said first frame;

a chamber within said housing for receiving gathered crops;

an open space disposed at one end of said chamber for allowing removal of gathered crops from the chamber;

a door for opening or closing said open space of the chamber;

door control means for selectively moving said door to an open or to a closed position, said door control means comprising:

a second frame pivotally attached to the first frame;

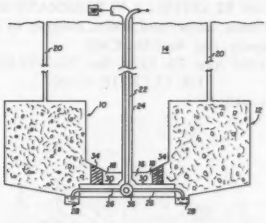
a cable operatively connected at one end to the second frame and operably connected at the other end to the door; and

means connected to said first and second frames for pivoting one of said frist and second with respect to the other frame from an unpivoted position to a pivoted position, whereby in the pivoted position the other end of the cable is pulled and the door is in an open position, and in an unpivoted position the other end of the cable is loosened and the door is in a closed position.

3,917,344
IN SITU RETORTING SYSTEM

Albert T. Janssen, Englewood, Colo., and Kailash Narayan, Los Angeles, Calif., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Aug. 22, 1974, Ser. No. 499,699
Int. Cl.² E21C 41/10
U.S. Cl. 299—2 8 Claims



1. A system for recovering carbonaceous values from an underground mineral deposit comprising:

a. at least one access entry extending substantially horizontally beneath the top of said deposit and communicating with the surface;

b. a plurality of designated adjacent zones within said deposit extending along at least one side of said at least one access entry in spaced relation thereto;

c. means for interconnecting the respective bases of said zones with said at least one access entry;

d. means for retorting said zones within said deposit adapted to release said carbonaceous values therefrom in liquefied form and to cause downflow thereof to the respective bases of said zones together with the gases evolved in said retorting operation;

e. sump means within said respective bases for collecting said liquefied values;

f. a plurality of spaced apart oil recovery conduits extending substantially vertically from the surface into said at least one access entry, the lower end of each of said conduits being thereafter branched to extend into said sump means of at least two of said zones through said interconnecting means; and

g. means for pumping said liquefied values from said sump means to the surface through said oil recovery conduits; and

h. means for scavenging said gases from the respective bases of said zones to the surface so as to apply continuous external heating to each of said oil recovery conduits.

3,917,345

WELL STIMULATION FOR SOLUTION MINING

Donald H. Davidson, Bedford, and Ray V. Huff, Acton, both of Mass., assignors to Kennecott Copper Corporation, New York, N.Y.

Filed Dec. 6, 1973, Ser. No. 422,239
Int. Cl.[2] E21C 41/10
U.S. Cl. 299—5 8 Claims

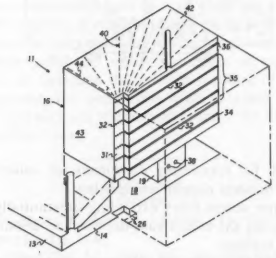
1. In a hydrometallurgical operation for the in-situ underground mining of a low grade copper-containing igneous rock formation by the use of a copper leaching solution for extracting copper values from said formation wherein at least one well extends from the surface of the earth into the formation, the improvement which comprises the steps of, prior to contacting said copper-containing formation with said leaching solution, injecting, at a pressure below the pressure producing new fractures in the formation, a hydraulic fluid through said well into the formation at a pressure sufficient whereby said fluid diffuses into the natural fractures of the formation surrounding said well and causes said natural fractures to increase in at least the cross-sectional area thereof and while maintaining said pressure, injecting a second fluid into said natural fractures through said well whereby the use of said second fluid substantially results in maintaining the increased cross-sectional area of said natural fractures after the pressure is reduced.

3,917,346

METHOD OF BLASTING A SUBTERRANEAN DEPOSIT

Albert T. Janssen, Englewood, Colo., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Aug. 22, 1974, Ser. No. 499,697
Int. Cl.[2] E21C 41/10
U.S. Cl. 299—13 11 Claims



1. In the development of a permeable zone within a subterranean ore deposit wherein the deposit is undercut to form a cavity therebeneath communicating with the surface and a designated block of the overlaying deposit is thereafter expanded to form said permeable zone, the method of blasting said overlaying block comprising the steps of:

a. driving at least one raise upwardly into said block from the roof of said cavity to a position adjacent the top level of said block,

b. drilling a plurality of blasting holes extending from said raise along substantially horizontal paths into said block in a plurality of similar radially expanding patterns, said patterns being situated respectively at each of a like plurality of vertically spaced apart levels disposed from adjacent the top of said raise to adjacent the bottom thereof,

c. at least partially filling said plurality of blasting holes with explosive charges, and

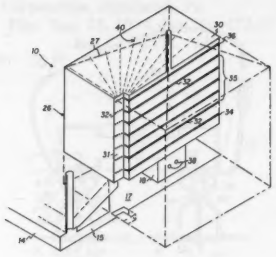
d. detonating said explosive charges to effect fragmentation of said overlaying block and expansion thereof to fill said undercutting cavity.

3,917,347

METHOD OF DEVELOPING A PERMEABLE UNDERGROUND ZONE

Albert T. Janssen, Englewood, Colo., and Atlantic Richfield Company, 02, Los Angeles, Calif.

Filed Aug. 22, 1974, Ser. No. 499,698
Int. Cl.[2] E21C 41/10; F42D 7/00
U.S. Cl. 299—13 11 Claims



1. A method of developing and shaping a permeable zone within a subterranean ore deposit so that it will have a lower portion of substantially constant horizontal cross-section below a predetermined level from which it tapers upwardly to an apex to form a cone-shaped upper portion comprising the steps of:

a. placing an explosive charge into the deposit adjacent said apex;

b. expanding a volume of said deposit underlying said predetermined level to form said lower portion; and

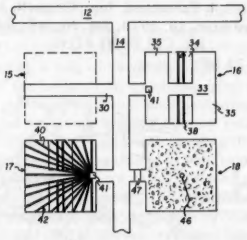
c. thereafter detonating said explosive charge to produce cratering of said deposit between said apex and said predetermined level so as to form said upper portion.

3,917,348

METHOD OF DEVELOPING PERMEABLE UNDERGROUND ZONES

Albert T. Janssen, Englewood, Colo., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Aug. 22, 1974, Ser. No. 499,696
Int. Cl.[2] E21C 41/10
U.S. Cl. 299—13 11 Claims



1. A method of developing a permeable zone within an underground mineral deposit comprising the steps of:

a. driving an access entry at a level below the top of the deposit,

b. driving a zone entry transversely from said access entry at said level into the deposit,

c. driving a plurality of crosscuts from said zone entry to form in combination with said zone entry a cavity undercutting the deposit, and

d. expanding a designated block of the deposit overlaying said cavity to fill said cavity and form said permeable zone.

3,917,349

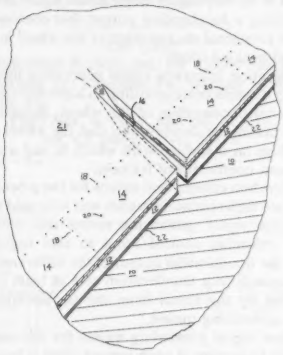
MINING METHOD INVOLVING SLIDING BLOCK OF OVERBURDEN ON GEL LUBRICANT

James Mansfield Cleary, Jr., 92 McCallum Drive Box 541, Falmouth, Mass. 02541

Filed Apr. 16, 1974, Ser. No. 461,301

Int. Cl.[2] E21C *37/12, 41/00*

U.S. Cl. 299—13 **56 Claims**



1. A method of moving a massive, substantially unbroken block of earth overburden to expose a portion of a subsurface formation beneath said overburden; comprising, separating said massive, substantially unbroken block of overburden from the adjacent overburden with which it initially forms a unitary mass, along generally-vertical planes and along a generally-horizontal, base plane adjacent the top of said subsurface formation; disposing a thin layer of a high gel strength lubricant paste beneath said block of overburden in the plane of separation along said generally-horizontal base plane; and sliding said substantially unbroken block of overburden on said layer of lubricant paste in a direction and for a distance sufficient to expose said portion of said subsurface formation.

3,917,350

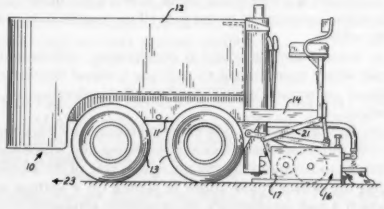
ICE RESURFACER CUTTING BLADE APPARATUS

Charles W. Bricher, St. Paul, Minn., assignor to Tennant Company, Minneapolis, Minn.

Filed Apr. 22, 1974, Ser. No. 462,724

Int. Cl.[2] A63C *19/10;* **E02B** *15/02;* **E01H** *5/06*

U.S. Cl. 299—24 **11 Claims**



1. An ice resurfacing machine comprising a self-propelled vehicle that normally travels in a forward direction, said vehicle having a frame, a sled dependingly attached to said frame, an ice shaving blade assembly that includes a transversely elongated blade support having a longitudinally front end portion and a rear end portion, a transversely elongated blade having a longitudinally rear end portion, intermediate portion and a front cutting edge portion, a blade holder having a first surface, a blade mounting surface inclined relative to and intersecting with said first surface and a surface portion opposite said first surface, a clamp bracket having one side thereof abutting against said surface portion and said blade, and fastening means for mounting the holder and the bracket on the support member and releasably retaining the clamp bracket and holder in abutting relationship to clampingly hold the blade in abutting relationship to the blade mounting surface, first adjustment means mounted on the sled for pivotably mounting the blade assembly and selectively varying the blade height and second adjustment means mounted on the sled and pivotally connected to the support member for selectively varying the blade angle.

3,917,351

TUNNELLING MACHINES

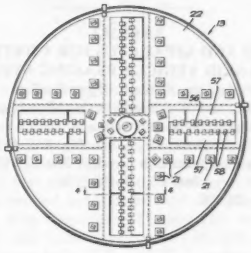
Norman Duncan Pirrie, and John Bland, both of London, England, assignors to Sir Robert McAlpine & Sons Limited, London, England

Filed Apr. 1, 1974, Ser. No. 456,726

Claims priority, application United Kingdom, Apr. 16, 1973, 18253/73

Int. Cl.[2] B65D *65/00*

U.S. Cl. 299—90 **5 Claims**

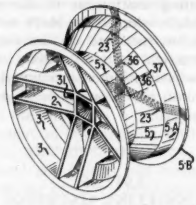


1. In a tunnelling machine which includes a cylindrical shield, a cutting head rotatably mounted at the front end of the shield for rotary cutting movement, and means drivingly connected to the cutting head for rotating the head in either direction of rotation and in which the cutting head extends across the full width of a tunnel to be cut and comprises a bulkhead mounted at the front of the cutting head and extending across the cutting head and having at least one substantially radial slot through which spoil passes during the cutting movement; the improvement which comprises a first and second cutting blade pivotally mounted at opposed edges of the slot for pivotal movement about substantially radial axes between a first position where the first blade is inclined towards the tunnel face and the second blade is inclined away from the tunnel face for cutting in one direction of rotation, and a second position where both blades lie in the plane of the bulkhead for sealing off the slot and a third position where said second blade is inclined towards the tunnel face and said first blade is inclined away from the tunnel face for cutting in the other direction of rotation, and means for moving the cutting blades to the said three positions.

3,917,352
CONTINUOUS-STRAND, FIBER REINFORCED PLASTIC WHEEL

Steven Douglas Gageby, 2025 N. Bradley, St. Paul, Minn. 55117

Continuation-in-part of Ser. No. 340,342, March 12, 1973, abandoned. This application June 3, 1974, Ser. No. 476,058
Int. Cl.[2] B60B *1/06*
U.S. Cl. 301—63 PW 24 Claims

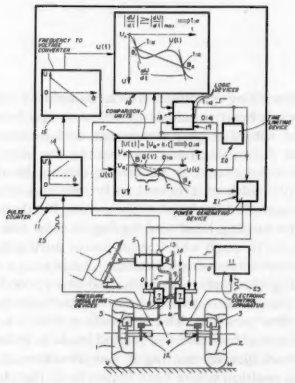


1. A wheel for pneumatic tires and the like, comprising:
a. a fiber reinforced plastic central hub portion adapted to be rotatably mounted;
b. and a rim formed to the hub portion for receiving a tire, the rim having first and second circumferential, tire engaging bead regions on opposite sides of the rim, the rim comprising a plurality of resin encased filament lengths extending continuously from one bead region over the hub portion to the opposite bead region, whereby torsional forces exerted on the rim are resisted in tension by the filament lengths.

3,917,353
METHOD AND APPARATUS FOR CONTROL OF ANTI-SKID VEHICLE BRAKING SYSTEM

Lennart Bror Anders Swiden, Bjornsbacken 32, S-59061 Vreta Kloster, and Waldemar Lester, Bondegatan 11 B, S-58263 Linkoping, both of Sweden

Filed Feb. 4, 1975, Ser. No. 439,402
Claims priority, application Sweden, Feb. 6, 1973, 7301592
Int. Cl.[2] B60T *8/08*
U.S. Cl. 303—21 BE 2 Claims



1. In a vehicle having a wheel which engages a surface that the vehicle traverses, a brake through which braking force can be applied to the wheel to effect frictional retardation of the rotational speed of the wheel, a brake control element manually movable to and from a position in which braking force is produced, and regulator means for relieving braking force from the wheel in response to a brake releasing control input and for reapplying braking force to the wheel in response to a brake reapplying control input, so that the wheel can be alternately braked and released to prevent its locking, control means for said regulator means by which said control inputs are produced at such times as to assure deceleration of the vehicle substantially as quickly as conditions of said surface permit, said control means comprising:
A. speed signal means for generating a speed signal which corresponds to the rotational speed of the wheel;
B. differentiating means connected with the speed signal means to be responsive to the speed signal therefrom, for generating a deceleration output that corresponds to the rate of rotational deceleration of the wheel in response to applied braking force;
C. deceleration reference signal generating means for generating a signal corresponding to a predetermined rate of rotational deceleration of the wheel, substantially equal to the maximum deceleration that the wheel could attain in sliding on a surface with which it had a substantially optimum coefficient of friction;
D. deceleration comparison means for the wheel, connected with said differentiating means and with said deceleration reference signal generating means and which issues a brake releasing control input to said regulator means when the deceleration output of the differentiating means corresponds to a deceleration rate at least equal to that signified by the signal from the deceleration reference signal generating means;
E. gradient signal generating means for the wheel for producing, beginning at each instant when a brake releasing control input is produced, a gradient signal which initially corresponds to the actual rotational speed of the wheel at said instant and including means for thereafter causing the gradient signal to correspond at each instant to the instantaneous rotational speed that the wheel would have if it had decelerated from said actual rotational speed at the maximum rate of deceleration that the vehicle could attain on a surface providing the lowest expectable friction with the wheel; and
F. wheel speed comparison means connected with said speed signal means and said gradient signal means, for issuing a brake reapplying control input to said regulator means at that time after issuance of each brake releasing control input when rotational speed of the wheel becomes equal to the wheel speed then signified by the gradient signal.

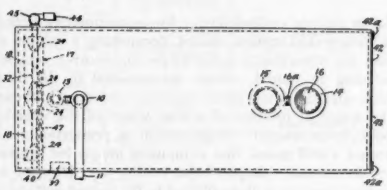
2. The method by which a brake for a wheel of a vehicle can be temporarily released to prevent wheel locking and reapplied to obtain the optimum deceleration of the vehicle that is available on a surface traversed by the wheel, each release of the brake being effected in response to a release input to regulator means for the brake and each reapplication of the brake being effected in response to a restoration input to the regulator means, said method being characterized by:
A. producing a wheel speed signal which at all times during braking corresponds to the prevailing rotational speed of the wheel;
B. at times when the wheel is decelerating, differentiating said wheel speed signal to produce a wheel deceleration signal corresponding to the rate of deceleration of the wheel;
C. producing a deceleration criterion signal which is comparable with said wheel deceleration signal and which corresponds to substantially the maximum rate of deceleration that the wheel could attain in sliding on a surface with which it had substantially the maximum attainable coefficient of friction;
D. issuing a brake releasing input to the regulator means at each instant when the wheel deceleration signal becomes at least equal to the deceleration criterion signal;

E. at each said instant beginning the generation of a speed criterion signal
1. which is comparable with the wheel speed signal,
2. which has an initial magnitude corresponding to the actual speed of the wheel at said instant, and
F. so effecting the speed criterion signal as to produce thereafter an instantaneous magnitude corresponding to the rotational speed that the wheel would have had if it had decelerated from said actual speed at a rate corresponding to the maximum deceleration that the vehicle could attain on a surface providing the lowest expectable friction with the wheel; and
G. issuing a restoration input to the regulator means when the magnitude of the wheel speed signal becomes equal to that of the speed criterion signal.

3,917,354
CONTAINERIZED HANDLING OF FLOWABLE SOLIDS

Russell J. Adams, Jr., Lansdale, Pa., assignor to Matlock, Inc. Lansdowne, Pa.

Filed Nov. 6, 1970, Ser. No. 87,415
Int. Cl. B65g *53/40, 53/38*
U.S. Cl. 302—52 **2 Claims**



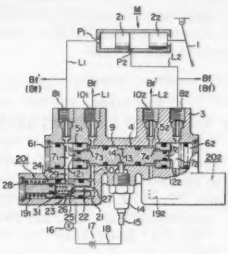
1. A substantially retangular bulk cargo container adapted to be transported on the bed of a truck or other carrier, said container having flat side, end, bottom and top wall panels, said panels being joined together in a rectangular configuration with the panels being substantially free of exterior side and end projections and having substantially air tight seams, said container having an inlet coupling adapted to be connected to a hose for filling the container with dry bulk flowable material, a vent means in the container including a filter and a removable cover, said vent means providing a restricted air flow passage for the escape of air during loading of the container and for maintaining a slight positive pressure with respect to the outside of the container, thereby maintaining the contents in an uncontaminated state until use, discharge means at the bottom of the container comprising a hopper structure located at one end of the container, said hopper structure including inclined wall portions and gate means comprising a rotatable gate valve adapted to close the hopper in one position and being adjustably locked in a plurality of angularly spaced apart positions whereby the flow of material discharged is adjustably controlled, means for tilting the container toward the end having the hopper, and support rails on the bottom walls of the container for sliding the container on a trailer bed or other support surface.

3,917,355
FLUID PRESSURE CONTROL DEVICE WITH A FAILURE ALARM FOR A VEHICLE BRAKE SYSTEM

Hiroo Takeuchi, Ueda, Japan, assignor to Nisshin Kogyo Kabushiki Kaisha, Ueda, Japan

Filed Feb. 19, 1975, Ser. No. 551,152
Claims priority, application Japan, Apr. 17, 1974, 49-42879
Int. Cl.² B60T *11/34, 17/22*
U.S. Cl. 303—6 C **1 Claim**

1. In a vehicle brake system of the type including a dual brake master cylinder having a first and a second independent output port (P_1 and P_2), a first and a second hydraulic fluid line (L_1 and L_2) extending from said respective first and second output ports, a pair of right and left front wheel brakes (B_f' and B_f) having fluid chambers suitably connected with said first and second fluid lines, and a pair of right and left rear wheel brakes (B_r' and B_r) having fluid chambers connected respectively with said first and second fluid lines, a fluid pressure control device with a failure alarm, comprising a common casing (**3**) arranged on said first and second fluid lines (L_1 and L_2) between said brake master cylinder and said rear wheel brakes (B_r' and B_r) and defining a cylinder bore (**4**), a first and a second pressure-receiving piston (5_1 and 5_2) slidably fitted in said cylinder bore at the opposite ends thereof, a first and a second fluid chamber (7_1 and 7_2) defined on the outside of said respective pressure-receiving pistons and respectively communicating at all times with the upstream side of said first and second fluid lines (L_1 and L_2), a balance piston (**9**) slidably fitted in the mid-portion of said cylinder bore (**4**) so as to be normally held in a neutral position under the effect of said first and second pressure-receiving pistons (5_1 and 5_2), a third and a fourth fluid chamber (7_3 and 7_4) defined between the opposite ends of said balance piston (**9**) and said first and



second pressure-receiving pistons (5_1 and 5_2) and respectively communicating at all times with the downstream side of said first and second fluid lines (L_1 and L_2), bypass holes (12_1 and 12_2) extending through said respective first and second pressure-receiving pistons (5_1 and 5_2) for fluid communication between said first and third fluid chambers (7_1 and 7_3) and between said second and fourthe fluid chambers (7_2 and 7_4), respectively, plug formations (11_1 and 11_2) on the opposite end faces of said balance piston (**9**) slidably fitted in said respective bypass holes (12_1 and 12_2) so that either of said bypass holes is opened with sliding movement of said balance piston (**9**) in a direction opposite to the bypass hole to an extreme position, a first and a second control valve (20_1 and 20_2) respectively arranged between said first and third fluid chambers (7_1 and 7_3) and between said second and fourth fluid chambers ($_2$ and 7_4) to allow fluid flow from said first and second fluid chambers, respectively, into said third and fourth fluid chambers while effecting a reduction in pressure at a predetermined ratio, and switch means arranged on said casing (**3**) and operable in response to sliding movement of said balance piston (**9**) in either direction from the neutral position thereof to actuate an external alarm (**16**).

3,917,356
AIRCRAFT AUTOMATIC BRAKING SYSTEM

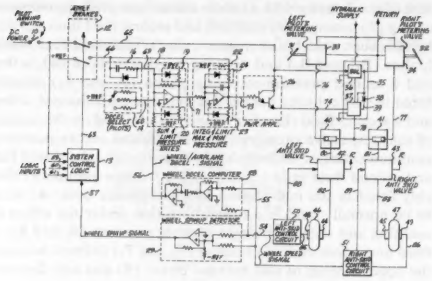
Garrett H. DeVlieg, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sept. 6, 1973, Ser. No. 394,890
Int. Cl.² B60T *8/08*
U.S. Cl. 303—21 BE **6 Claims**

3. In combination in an aircraft automatic brake control system:
valve means for controlling brake pressure application to a plurality of wheels of said aircraft;

system control logic circuit means responsive to wheel spin-up for providing a system logic control signal for actuating said system;

means for generating a signal representative of a commanded rate of deceleration.

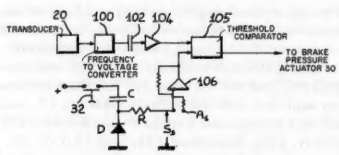


means responsive to said system logic control signal for adding a variable level command signal to said commanded rate signal upon actuation of said system which variable level command signal decays to zero amplitude in a predetermined time period.

3,917,357
ELECTRONIC ANTI-SKID BRAKING SYSTEM FOR VEHICLES

Adriano Stratta, Turin, and Enrico Bruni, Ferrara, both of Italy, assignors to Fiat Societa per Azioni, Turin, Italy

Filed June 25, 1974, Ser. No. 482,926
Claims priority, application Italy, Oct. 22, 1973, 70102/73
Int. Cl.[2] B60T *8/08*
U.S. Cl. 303—21 CG **1 Claim**

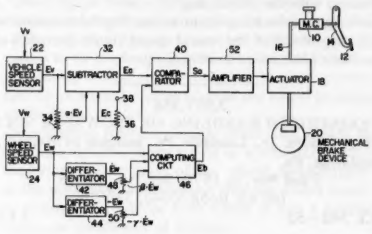


1. In a vehicle antiskid wheel braking system having a wheel angular velocity sensor; means connected to said angular velocity sensor for deriving a wheel deceleration signal; an electronic control circuit connected to said sensor; actuator means for controlling the pressure applied to the brakes in dependence upon the signals received from said control circuit; and comparator means for comparing said deceleration signal with a predetermined deceleration threshold level, said actuator means being connected to said comparator means and being controlled in dependence upon said wheel deceleration signal, wherein the improvement comprises: a summing circuit; an auxiliary voltage source providing an auxiliary voltage as one input to the summing circuit, said auxiliary voltage source comprising a series connected capacitance and diode, a resistor connected between the summing circuit and the junction of said series-connected capacitance and diode, means connecting the anode of the diode to ground and means connecting said capacitance to a power source of the vehicle; means providing said predetermined threshold voltage level as another input to the summing circuit, the output of the summing circuit comprising an increased threshold voltage level which is applied as a threshold level to the comparator circuit, and means rendering said voltage source inoperative after the first brake release cycle of operation of the antiskid braking system.

3,917,358
CONTROL DEVICE FOR AN AUTOMOTIVE BRAKE SYSTEM

Yasuhisa Takeuchi, and Haruhiko Iizuka, both of Yokosuka, Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed July 9, 1974, Ser. No. 486,852
Claims priority, application Japan, July 11, 1973, 48-78038
Int. Cl.[2] B60T *8/08*
U.S. Cl. 303—21 BE **3 Claims**



1. An electric control device for an automotive brake system having skid control means, comprising a vehicle speed sensor for detecting a speed of an automotive vehicle and producing an output voltage proportional to the detected vehicle speed, a wheel speed sensor for detecting a circumferential speed of rotation of a road wheel of the vehicle and producing an output voltage which is proportional to the detected wheel speed, first computing means for subtracting from the output voltage of the vehicle speed sensor a first variable reference voltage related to the output voltage of the vehicle speed sensor, first differentiating means for differentiating the output voltage of the wheel speed sensor with respect to time and producing an output voltage proportional to a rate of increase of the output voltage of the wheel speed sensor, second differentiating means for differentiating the output voltage of the wheel speed sensor with respect to time and producing an output voltage proportional to a rate of decrease of the output signal of the wheel speed sensor, second computing means for adding to the output signal of the wheel speed sensor a second variable reference voltage proportional to the output voltage from the first differentiating means and substracting from the output voltage of the wheel speed sensor a third variable reference voltage proportional to the output voltage from the second differentiating means, and comparing means for comparing the output voltages from the first and second computing means with each other and producing a digital signal when the output voltage from the first computing means is higher than the output voltage from the second computing means whereby a braking force applied to the road wheel is lessened in response to the digital signal.

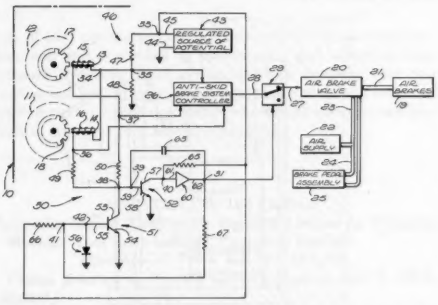
3,917,359
ANTI-SKID BRAKE CONTROL SYSTEM AND FAILSAFE CIRCUIT THEREFOR

Said Sapir, Los Angeles, Calif., assignor to International Telephone & Telegraph Corporation, New York, N.Y.

Filed Aug. 6, 1974, Ser. No. 495,227
Int. Cl.[2] B60T *8/00*
U.S. Cl. 303—21 AF **12 Claims**

1. An anti-skid brake control system comprising: a land vehicle having first and second wheels; first and second electromagnetic pick-ups mounted on said vehicle for producing first and second series of pulses, respectively, at first and second respective pulse repetition frequencies directly proportional to the respective speeds of said first and second wheels, said first and second pick-ups including first and second inductive windings, respectively; an air brake valve; a brake pedal assembly; a supply of fluid under pressure con-

nected to said valve and to said brake pedal assembly; a set of fluid pressure operable brakes connected from said valve, said valve being operable by fluid under pressure supplied in response to pressure on said brake pedal assembly, said valve having an electrical input lead, said valve being deactuable by predetermined electrical signals applied to said input lead thereto; an anti-skid brake system controller connected from both of said first and second windings to said valve input lead to supply signals to the latter on predetermined conditions to override the fluid pressure supplied to said brakes in response to pressure on said brake pedal assembly; and for override means connected from both of said windings for interrupting control of said valve by said controller when at least one of said windings develops an open, a regulated source of potential being provided having a first output lead connected to a point of reference potential, and a second output lead, said windings each having a first lead connected from the second output lead of said source, and a second lead, first and second transistors each having a collector, an emitter and a base, a first resistor connected from the second output lead of said source to said first transistor base, an amplifier having an input



lead and an output lead, a second resistor connected from said amplifier input lead to the second output lead of said source, a third resistor connected from said amplifier output lead to said first transistor base, a diode connected from said first transistor base to said point of reference potential, both of said emitters being connected to said point of reference potential, a fourth resistor connected from the second lead of said first winding to said second transistor base, a fifth resistor connected from the second lead of said second winding to said second transistor base, a capacitor connected from said amplifier output lead to said second transistor base, said amplifier means output signals being produced on said amplifier output lead, said first transistor collector being connected from said second transistor base, said second transistor collector being connected to said amplifier input lead, and control means connected from said amplifier output lead to suppress the output of said controller and the input to said valve which would otherwise be impressed on said valve input lead by said controller, said control means being actuable to suppress said controller output and said valve input when either one of said windings develop an open either one at a time or both together.

3,917,360
SNOWMOBILE TRACK

Marc Gregoire, Ste-Henedine, Canada, assignor to Elast-O-Flex, Inc., Quebec, Canada

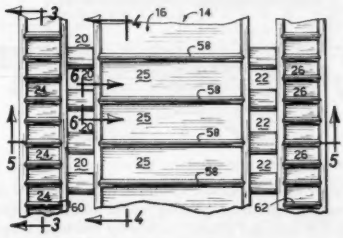
Filed Oct. 17, 1973, Ser. No. 407,224

Claims priority, application Canada, June 19, 1973, 174,416

Int. Cl.² B62D *55/08*

U.S. Cl. 305—30 **6 Claims**

1. An endless driving track for use in a snowmobile or the like and adapted to be entrained around front and rear sprockets of the snowmobile, comprising: a central portion comprising a continuous strip of elastomeric material having inner and outer surfaces, at least two lateral portions comprising continuous strips of elastomeric material laterally spaced and longitudinally extending relative to said central strip having inner and outer surfaces; a plurality of equidistantly spaced reinforcing members incorporated in said strips and extending transversely thereof; and cleat means mounted on the reinforcing members and defining with said spaced strips at least one row of sprocket-teeth-receiving openings extending longitudinally of the track, each of said cleat means comprising a cleat member having interior walls defining an opening extending transversely through said cleat member, said walls further defining upper and lower portions within said opening,



said walls defining said lower portion tightly engaging the side and bottom portions of said reinforcing means extending transversely through said at least one row portion of said track so as to prevent rotation of said cleat means about said reinforcing means, said walls defining said upper portion being spaced from the top portion of said reinforcing means, elastomeric material extending within said upper portion so as to engage the top portion of said reinforcing means, the walls defining said upper portion and the strips of elastic material so as to be integral therewith, said elastomeric material within said upper portion providing a flexible cushion for adsorbing forces applied to said track during use.

3,917,361
FRICTION BEARING

Henry W. Murdoch, Houston, Tex., assignor to Reed Tool Company, Houston, Tex.

Filed Jan. 30, 1974, Ser. No. 437,897

Int. Cl.² F16C *19/00*

U.S. Cl. 308—8.2 **12 Claims**

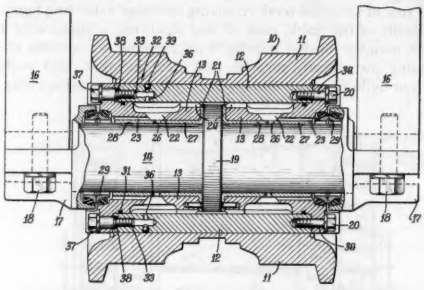
1. An earth drilling bit comprising:
a head,
at least one bearing shaft on said head,
a cutter rotatably mounted on said shaft,
a metallic bearing bushing between said shaft and cutter,
the said bushing being divided whereby a space is provided between confronting ends of the bushing to accomodate any circumferential growth of the bushing, occasioned by operational frictional heat and plastic deformation of the bushing, to prevent seizure of the bushing in the cutter, the thickness of the bushing being no greater than approximately one sixteenth inch per inch of inside diameter of the bushing so that the bushing is flexible.

3,917,362

LUBRICATED TRACK ROLLER

Robert N. Stedman, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 17, 1973, Ser. No. 424,922
Int. Cl.[2] F01M *11/04*; **F16C** *13/00, 33/74, 35/02*
U.S. Cl. 308—20 **6 Claims**



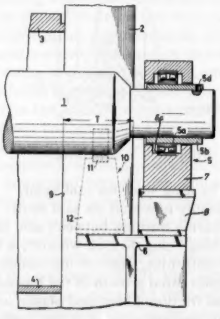
1. A roller having hollow cylindrical hub means for mounting rim means thereupon, bearing means mounted within said hollow hub means and affixed thereto for rotatably supporting said hub means upon a shaft, said bearing means including cavity means for containing lubricating medium, said bearing means being affixed to said hub means by means of a plurality of bolts received within a corresponding plurality of bores in said hub means, at least one of said bores communicating with said cavity means for transmitting said lubricating medium to and from said cavity means through said at least one bore, said at least one bore including a counterbored portion and a reduced diameter portion, said reduced diameter portion extending longitudinally along said hub means to a point laterally aligned with said cavity means, and wherein a radial port is provided in said hub means for intersecting said reduced diameter portion and for communicating said portion with said cavity means, said radial port completely transpierces said hub means and wherein one end of said radial port is closed by means of a plug.

3,917,363

BEARING FOR A CONVEYOR AXLE OF A TRAVELING GRATE

Reinhard Korting, Neubeckum, Germany, assignor to Polysius AG, Neubeckum, Germany

Filed Sept. 20, 1973, Ser. No. 398,953
Claims priority, application Germany, Dec. 7, 1972, 44838
Int. Cl.[2] F16C *13/04, 35/00, 39/00*
U.S. Cl. 308—35 **5 Claims**



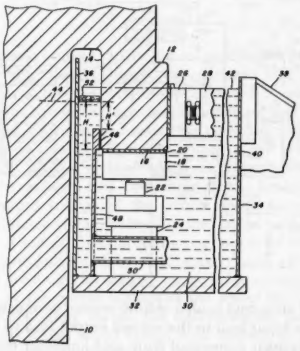
1. In combination with a rotary, cylindrical, traveling grate axle at least one end of which extends through a casing in which the traveling grate is housed: first bearing means removably encircling said axle adjacent said one end thereof and spaced from said casing; means removably supporting said first bearing means in such position that said one end of said axle normally is at a predetermined level; auxiliary bearing means for supporting and journaling said axle; and removable support means for supporting said auxiliary bearing means from below the latter and supporting said auxiliary bearing means in a position between said first bearing means and said casing with said one end of said axle at said level; said auxiliary bearing means comprising part of a ring formed on an arc corresponding to the curvature of the axle, each of said first and said auxiliary bearing means being removable during rotation of said axle.

3,917,364

VERTICAL THRUST BEARING LUBRICANT SEAL

Earl C. Kuhn, Verona, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 22, 1974, Ser. No. 435,547
Int. Cl.[2] F16C *1/24, 33/72*; **F16J** *15/00*; **F16J** *15/54*
U.S. Cl. 308—36.1 **5 Claims**



1. In a thrust bearing assembly for a vertical shaft having a thrust runner encircling the shaft with an annular space therebetween, bearing means engaging the thrust runner for supporting the shaft, a lubricant reservoir containing said bearing means, said reservoir having an inner cylindrical wall extending between and spared from the shaft and the thrust runner and an outer cylindrical wall outside of the thrust runner, liquid lubricant filling the reservoir to a level above the bearing means, a cylindrical seal member extending circumferentially around the thrust runner in the space between the thrust runner and said inner wall below the normal level of the lubricant, said cylindrical seal member having a close clearance with the thrust runner such that lubricant flow through the clearance is laminar under normal operating conditions and an annular seal member resting on the surface of the lubricant in the space between said inner wall and the thrust runner and substantially covering said surface.

3,917,365

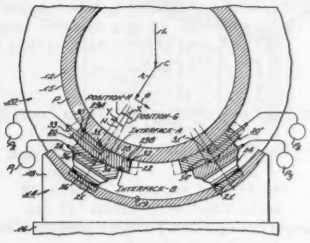
PIVOTED BEARING PAD WITH CIRCUMFERENTIALLY ADJUSTABLE PIVOT POINT AND METHODS OF CIRCUMFERENTIALLY ADJUSTING SAID PIVOT POINT

Raymond C. Jenness, Milwaukee, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed May 28, 1974, Ser. No. 473,811
Int. Cl.[2] F16C *17/06*
U.S. Cl. 308—73 **14 Claims**

1. A pivoted bearing pad adapted to be in supporting relation to a journal for bidirectional rotation of the journal, said bearing pad comprising a pad portion having a journal bearing

surface, and a pivotal support portion adapted to support said bearing pad for pivotal movement on a stationary supporting surface, said pad portions and said pivotal support portion being secured to each other during normal operation of the journalled apparatus but being detachable from each other to permit circumferential adjustment of the circumferential location of said pivotal support portion relative to said pad portion, and means carried by said bearing pad admitting high pressure hydraulic fluid at the interface between said pad portion and said pivotal support portion whereby to facilitate relative circumferential adjusting movement between said pad portion and said pivotal support portion.



3,917,366

HYDROSTATIC BEARINGS

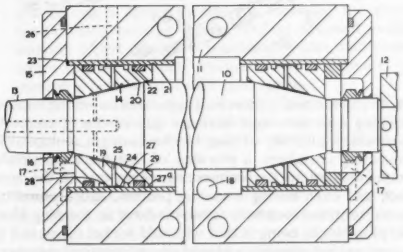
Peter Alan Mason, Kenilworth, England, assignor to Wickman Machine Tool Sales Limited, Coventry, England

Filed Apr. 1, 1974, Ser. No. 457,472

Claims priority, application United Kingdom, Apr. 3, 1973, 15863/73

Int. Cl.² B61F *17/00;* **F16C** *1/24, 13/02, 33/66*

U.S. Cl. 308—122 **5 Claims**



1. A hydrostatic bearing between a body and a spindle, the body containing a bearing sleeve which is non-rotatably secured to the body, the sleeve having a plurality of pockets on its face presented to the spindle, a cushion of fluid being maintained in use in said pockets, the sleeve having entry ports therethrough affording communication between the pockets and a supply duct for fluid in the body and there being defined between the supply duct and the entry ports a flow restricting means in the form of a shallow recess with which the supply duct communicates, the entry ports communicating with the recess at a position spaced from the supply duct, the recess being bounded by peripheral deeper grooves, and the supply duct communicating with said grooves and the entry ports communicating with the recess at a position spaced from said peripheral grooves.

3,917,367

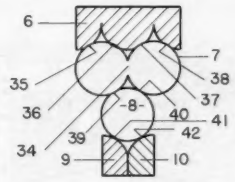
MINIMUM FRICTION BEARING

Clair Francis Kirk, 856 Pine St., Wheatland, Wyo. 82201

Filed Jan. 26, 1973, Ser. No. 327,785

Int. Cl.² F16C *33/00*

U.S. Cl. 308—206 **10 Claims**



1. A radial roller bearing comprising a solid race cut with convex grooves, with the said convex grooves support line point contact confining thrust of convex grooved straddle rollers by the convex surfaces of the said straddle roller grooves seated on each side of the ridge between two adjacent convex grooves in the said solid race with the said straddle rollers support line point contact confining thrust of spherical rollers by the said spherical rollers being seated in the convex grooves of the said straddle rollers with the said spherical rollers also receiving support line point contact confinement of thrust by a sectional race, said sectional race comprising convex rings secured together with the said spherical rollers seated in the convex grooves formed between the said secured convex rings.

3,917,368

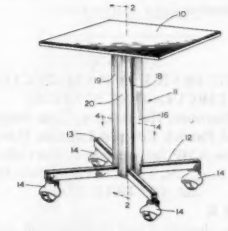
PEDESTAL STAND COLUMN ASSEMBLY

Walter Gusdorf, Creve Coeur, and Walter E. Smith, St. Louis County, both of Mo., assignors to Gusdorf & Sons, Inc., St. Louis, Mo.

Filed Oct. 7, 1974, Ser. No. 512,546

Int. Cl.² E06B *01/14;* **E04C** *03/32*

U.S. Cl. 312—254 **6 Claims**



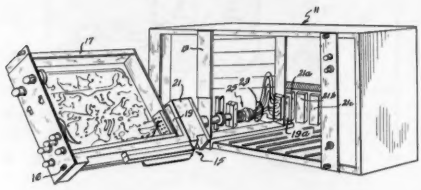
1. In a knockdown pedestal stand having components which comprise floor engaging leg means; a top; and a column for joining said top and said leg means, said column being formed from sheet material bent into a three sided elongated member in which one side supports two opposed sides, each of said opposed sides having a flange thereon bent into opposed facing relation and being spaced to define the margins of a slot in said column, and said column including a panel having opposite margins formed with grooves, said panel being positioned in said slot with said grooves slidingly embracing said opposed flanges.

3,917,369

ADJUSTABLE EXTENDER FOR INSTRUMENT MODULE

John B. Sevec, Joliet, and Albert D. Stein, Park Forest, both of Ill., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Aug. 26, 1974, Ser. No. 500,788
Int. Cl.[2] H01B 07/06; H01R 05/00
U.S. Cl. 312—333 4 Claims



1. In a blank module adapted to be received within an instrument console in place of an instrument module, said instrument console comprising a housing for containing a plurality of instrument modules each of which having instrumentation coupled to said console through mating, connector halves, one of said mating connector halves being carried by said console and said other mating connector half being carried by said instrument module, said blank module comprising a structural frame for insertion within said console in place of said instrument module, an instrument mount carried by said frame for supporting said instrument module in forward and accessible extension from said console and coupling means supported by said frame for interconnecting said instrument module to said console, said coupling means including first and second connector halves at opposite ends of said blank module with interconnecting instrumentation leads therebetween, said first connector half adapted to matingly engage said connector half carried by said console and said second connector half adapted to matingly engage said connector half carried by said instrument module, the improvement comprising rotatable support means within said blank module for supporting said instrument mount in a plurality of angular dispositions in respect to said blank module, said rotatable support means including releasable locking means for locking said instrument mount in each of said plurality of angular dispositions and for releasing said instrument mount for rotation to other of said angular dispositions.

3,917,370

INTERCONNECT DEVICE FOR USE IN CLOSED FLUID CIRCULATING SYSTEMS

David Charles Thornton, Harrisburg; Linn Stephen Lightner, Camp Hill, and Patrick Edward Lannan, Harrisburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 29, 1974, Ser. No. 501,541
Int. Cl.[2] H01R 3/04
U.S. Cl. 339—16 R 3 Claims

1. A composite electrical and fluid conduit connector comprising:

two mating members of insulation material, each member having a contact face, at least one contact passage and at least one conduit passage, each said passage extending through said member and opening on said face in opposition to like passages in the mating member;

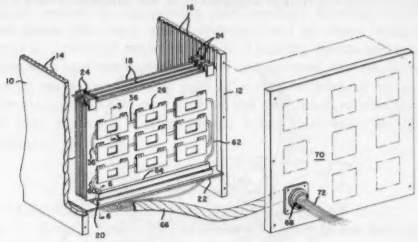
pairs of matable electrical contacts mounted in respective pairs of said contact passages; and

pairs of matable hermaphroditic fluid connection members mounted in respective pairs of said conduit passages, each said fluid connection member comprising:

a body adapted to be mounted in said fluid conduit and having a fluid passage therethrough;

means on one end of said body for fluid tight coupling to an associated fluid circuit;

deformable resilient sealing means on the opposite end of said body, said sealing means having a fluid passage coaxial with the passage in said body;



valve means having a stem portion extending at least part of the way through the passage in said sealing means and an integral head portion adapted to engage said sealing means in a fluid tight fashion; and

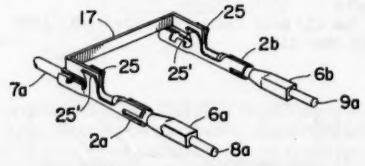
spring means normally biasing the head portion of said valve means against said seal in a fluid tight manner.

3,917,371

ELECTRICAL CONNECTING APPARATUS

Kazuaki Hirokawa, and Tsugio Anbo, both of Tokyo, Japan, assignors to Shinagawa Automotive Electric Wire Co., Ltd., Tokyo, Japan

Filed Apr. 6, 1973, Ser. No. 348,820
Claims priority, application Japan, Apr. 6, 1972, 47-34646
Int. Cl.[2] H01R 31/08
U.S. Cl. 339—19 4 Claims



1. In an electrical connecting apparatus for wiring harnesses including a socket block having a multiplicity of connecting chambers, a plurality of plug blocks having a multiplicity of connecting chambers, a plurality of first terminal members accommodated in the connecting chambers of the socket block and each having a mating portion, and a plurality of second terminal members accommodated in the plug blocks, said plug blocks being mated with said socket block in a predetermined relationship and said second terminal members in said plug blocks being mated via the mating portions with said first terminal members in said socket block, all of the wires in each wiring harness being connected to the second terminal members of a corresponding plug block, and further at least one of said first terminal members mating with one of said second terminal members in one plug block being electrically interconnected with at least another of said first terminal members mating with one of said second terminal members in another plug block; the improvement comprising:

a contact blade portion provided at approximately the center of each of said first terminal members and extending vertically therefrom, so that said contact blade portion is separated from the mating portion on each first terminal member,

electrically conductive connecting bar means for directly interconnecting the contact blade portions on at least two of said first terminal members, said connecting bar means

comprising a plurality of electrically conductive connecting bars for selectively and directly interconnecting the contact blade portions of any pair of said first terminal members, and

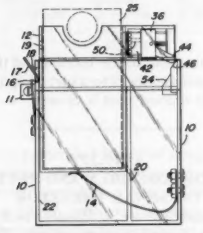
a connecting bar holder for holding said connecting bars and secured to said socket block at a place different from that at which said socket block is mated with said plug blocks,

said socket block comprising a plurality of socket members each accommodating a multiplicity of said first terminal members arranged side by side, said socket members being piled on each other to form a stack.

3,917,372
SUPPORTING AND CONNECTING STRUCTURE FOR ELECTRIC DEVICE

George J. Selinko, Lighthouse Point, Fla., assignor to Motorola, Inc., Chicago, Ill.

Filed Oct. 3, 1974, Ser. No. 511,545
Int. Cl.² H04B *1/034;* **H01R** *13/62*
U.S. Cl. 339—75 M **18 Claims**



1. A supporting and connecting structure for a portable electric device which has an electrical connector thereon, including in combination:

a frame having means defining a passage,

a housing movably mounted in said passage of said frame and having a cavity therein for receiving the electric device, said housing having a first released position wherein a part thereof is positioned within said passage and a second operated position wherein a greater part thereof is positioned within said passage,

electrical connector means movably supported on said housing and having an actuating arm, said connector means being adapted to couple with the electrical connector of the device, and

cam means on said frame positioned to be engaged by said actuating arm of said connector means, said cam means engaging said actuating arm of said connector means as said housing moves from said first position toward said second position to cause said connector means to move to a position to couple with the electrical connector of the device.

3,917,373
COUPLING RING ASSEMBLY

George Peterson, Berwyn, Ill., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed June 5, 1974, Ser. No. 476,613
Int. Cl.² H01R *13/54*
U.S. Cl. 339—89 R **22 Claims**

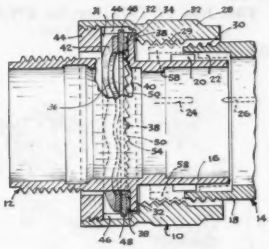
1. A coupling assembly for coupling one electrical connector shell with another shell having threads,

a coupling ring with threads rotatably carried on said one shell and rotatable in one direction for engaging the threads on said ring with the threads on the other shell to couple the shells,

first cam means rotatable with said coupling ring, second cam means on said one shell,

means engaging said first cam means with said second cam means,

means including the engaged cam means for automatically disengaging one of the cam means from the other of the cam means in response to the application of one predetermined force to said ring and cam means for rotating said ring in one direction to thereby engage the threads on



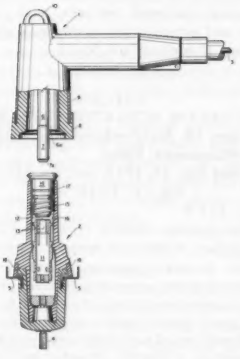
said ring with the threads on the other shell to couple the shells,

and means on each cam means for automatically disengaging one of the cam means from the other of the cam means only in response to the application of another force greater than said one predetermined force to said ring and cam means for rotating said ring in a direction opposite said one direction to thereby uncouple said shells.

3,917,374
ELECTRIC CONNECTOR APPARATUS

Robert E. Murdock, Stone Mountain, Ga., assignor to Kearney-National Inc., Atlanta, Ga.

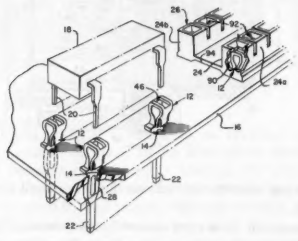
Filed Aug. 19, 1975, Ser. No. 498,723
Int. Cl.² H01R *13/52*
U.S. Cl. 339—111 **12 Claims**



11. A contact pin constituting a component of an electric connector apparatus, said contact pin comprising a tubular pin of conducting material, a stem of mechanically strong plastic material having a cap portion at one end and secured at its other end to the end of said tubular pin which is subjected to arcing and arranged in coaxial relation therewith.

and a hollow tubular sleeve of arc extinguishing material of considerably less mechanical strength than said stem and disposed about said stem and in coaxial relation therewith and having one end in snug engagement with said cap portion of said stem and having the other end in snug engagement with the adjacent end of said tubular pin of conducting material.

3,917,375
ELECTRICAL CONNECTION APPARATUS
Lennart B. Johnson, Milford, N.H., assignor to Teradyne, Inc., Boston, Mass.
Filed June 17, 1974, Ser. No. 479,843
Int. Cl.[2] H01R *13/00*
U.S. Cl. 339—112 R **18 Claims**



1. Panel-mounted electrical socket apparatus for a circuit device from which extend leads arranged in two side-by-side rows, said apparatus comprising

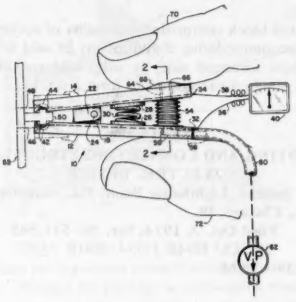
A. first and second side-by-side rows of socket contacts,

1. each socket contact extending within a separate aperture in each panel and having a folded contact clip disposed at least partly thereabove,
2. said contact clip having a folded, inverted, U-shaped configuration including a first clip arm extending toward and within the aperture, a bridging fold uppermost on said clip and apertured to receive a lead of said circuit device, and a second clip arm extending alongside said first clip arm and forming a resiliently-expandable contact area therewith for receiving therebetween the electrical lead, and

B. a heat sink of thermally-conductive material having an upper panel disposed between said rows of socket contacts and arranged for contiguous abutment against the bottom of such circuit device.

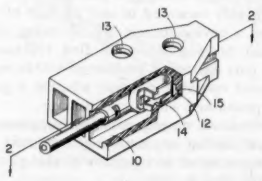
3,917,376
VACUUM ACTUATED TEST CLIP
Charles E. Lane, III, Meadowbrook, Pa., assignor to Honeywell, Inc., Minneapolis, Minn.
Filed Oct. 23, 1974, Ser. No. 517,383
Int. Cl.[2] H01R *3/04*
U.S. Cl. 339—117 P **3 Claims**

1. A clip for grasping objects, comprising a pair of spaced elongated members, a pivot pin supported transversely of said members and between associated intermediate portions thereof, a biasing means extending between two adjacent end portions of said members to provide a force for spreading said end portions apart and to simultaneously effect movement of the other end portions of said members toward one another to a grasping position, a flexible chamber defining means connected to and extending between said first-mentioned end portions, a first port extending through one of said first-mentioned end portions and opening into the interior of said flexible member, a vacuum pump, a conduit extending between said first port and said pump, a second port extending through the other one of said first-mentioned end portions and opening into the interior of said flexible chamber to provide said chamber with an atmospheric exhause vent, a portion of said member surrounding said second port being adapted to receive a portion of a finger to effect the closing of said second port, said vacuum pump being operable to create a vacuum in said



chamber, to effect a contraction thereof and the movement of the other end of said members to a spread apart, non-gripping position when said second port is closed.

3,917,377
CONNECTOR ASSEMBLY AND RECEPTACLE TERMINAL THEREFOR
Thomas E. Hall, and Wallace A. Hansen, both of Fort Wayne, Ind., assignors to Essex International, Inc., Fort Wayne, Ind.
Filed May 15, 1974, Ser. No. 470,011
Int. Cl.[2] H01R *33/72*
U.S. Cl. 339—192 RL **4 Claims**



1. A receptacle terminal for gripping and making electrical contact to a cylindrical pin terminal, which comprises:

a unitary, electrically conductive body having a first end portion adapted to be crimped about an electrical conductor to make electrical contact thereto, a flat intermediate portion extending from said first end portion, and a second end portion bent back upon said intermediate portion to form a loop;

said intermediate portion and said second end portion comprising a unitary strip of substantially the same width throughout;

said second end portion being bent down at the end thereof to meet said intermediate portion; and

a tab struck out from said intermediate portion, said tab being bent down over said second end portion to rigidly fix said second end portion to said intermediate portion independently of said first end portion so that two electrical current paths are formed from said loop to said intermediate portion.

3,917,378
FREQUENCY-ENCODED FOCUSSED IMAGE HOLOGRAM RECORD

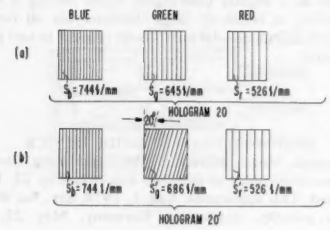
Michael Thomas Gale, Langnau am Albis, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed May 13, 1974, Ser. No. 469,218

Claims priority, application United Kingdom, Jan. 30, 1974, 04225/74

Int. Cl.² G03H 1/28, 1/02

U.S. Cl. 350—3.5 **2 Claims**



1. In a frequency-encoded focussed image hologram record capable of reconstructing a given recorded multicolor scene in response to said record being illuminated with a line source of white light and then projected through a longitudinal slit spatial filter oriented substantially parallel to said line source, said record comprising three superimposed spatially amplitude-modulated parallel diffraction gratings each of which corresponds to a different one of three primary spectral wavelength color components of said given recorded multicolor scene; the improvement wherein:

a. a first of said three diffraction gratings corresponding to the shortest spectral wavelength primary color component has a given line orientation, has a predetermined line frequency, and is spatially amplitude-modulated in accordance with the relative distribution of said shortest spectral wavelength primary color component of said given recorded multicolor scene;

b. a second of said three diffraction gratings corresponding to the longest spectral wavelength primary color component has a line orientation substantially parallel to said given line orientation, has a line frequency substantially equal to the ratio of said shortest spectral wavelength to said longest spectral wavelength multiplied by said predetermined line frequency, and is spatially amplitude-modulated in accordance with the relative distribution of said longest spectral wavelength primary color component of said given recorded multicolor scene, and

c. a third of said three diffraction gratings corresponding to the spectral wavelength primary color component intermediate said shortest and longest spectral wavelength primary color components has a line orientation rotated through a given angle with respect to said given line orientation, said given angle being sufficiently small to substantially maintain colorimetry of said reconstructed given multicolor scene, said third diffraction grating having a line frequency substantially equal to the ratio of said shortest spectral wavelength to said intermediate spectral wavelength multiplied by said predetermined line frequency and divided by the cosine of said given angle, and said third diffraction grating being spatially amplitude-modulated in accordance with the relative distribution of said intermediate spectral wavelength primary color component of said given recorded multicolor scene.

3,917,379
OPTICAL IMAGE REPRODUCING SYSTEM FOR A HOLOGRAM USING A LINEAR WHITE LIGHT SOURCE

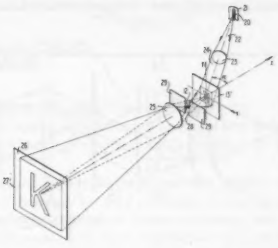
Masaru Noguchi, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Sept. 11, 1974, Ser. No. 504,945

Claims priority, application Japan, Sept. 11, 1973, 48-102335

Int. Cl.² G03H 1/28, 1/24

U.S. Cl. 350—3.5 **1 Claim**



1. An optical image producing system for a hologram comprising:

a white-light linear light source for radiating a white light beam having a lengthwise dimension much greater than its width;

a non-diffuse color image hologram having optical information of a colored object stored therein said hologram having been produced by the interaction of a divergent polychromatic object light beam and a mutually coherent parallel polychromatic reference light beam, for producing, when irradiated by the white light beam of said linear light source, a colored optical image of the object without any substantial scatter;

a lens interposed between said linear light source and said image hologram and receptive of the white light beam of the linear light source for changing the radiated white light into a parallel white light beam;

a scattering, positioned substantially parallel to said image hologram and at the opposite side thereof to said linear light source, for scattering an incident light beam to such an extent as to reproduce a visible optical image which is viewable from different directions;

a projecting lens interposed between said image hologram and said screen for projecting the optical image of said colored object from said image hologram onto said screen; and

a shielding plate interposed between said image hologram and said projecting lens and formed with a slit which extends in the lengthwise direction of said linear light source, said slit being positioned so that the optical image projected onto said screen contains all the colors used to produce said image hologram.

3,917,380
METHOD OF HOLOGRAM RECORDING WITH REDUCED SPECKLE NOISE

Makoto Kato, and Yoshihiro Okino, both of Kadoma, Japan, assignors to Matsushita Electric Industrial Company, Limited, Japan

Filed Dec. 26, 1973, Ser. No. 428,056

Claims priority, application Japan, Dec. 25, 1972, 48-3257; Dec. 26, 1972, 48-3824; Dec. 29, 1972, 48-3760; Dec. 29, 1972, 48-3758

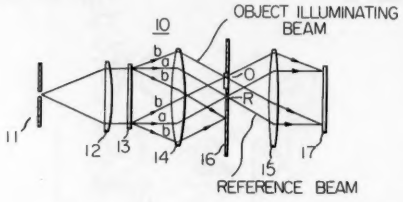
Int. Cl.² G03H 1/16, 1/32

U.S. Cl. 350—3.5 **12 Claims**

1. A holographic recording system for recording the hologram of an object transparency comprising:

a random phase illumination hologram receptive in use of substantially monochromatic spatially incoherent light for diffracting the incoherent light incident thereon into a zero-order diffracted beam of light and into a first-order diffracted array of sampled, phase-shifted beams of light; an image forming lens system receptive of the zero-order diffracted beam and the first-order diffracted array of light beams for focusing the zero-order diffracted beam and the first-order diffracted array of light beams in a focal plane which is also a Fourier transform plane with respect to said random phase illumination hologram;

a mask having a first and a second aperture and disposed in the focal plane of said image forming lens system for



allowing the transmittance of only the zero-order diffracted beam and the first-order diffracted array of light beams through the first and second apertures, respectively, and beyond the focal plane;

whereby the positioning of said object transparency in the focal plane at the second aperture of said mask will result in the intensity modulation of the first order diffracted array of light beams to form a holographic interference pattern between the zero-order difrracted beam and intensity modulated first-order diffracted array of light beams in a plane conjugate to said random phase illumination hologram with respect to said image forming lens system.

3,917,381

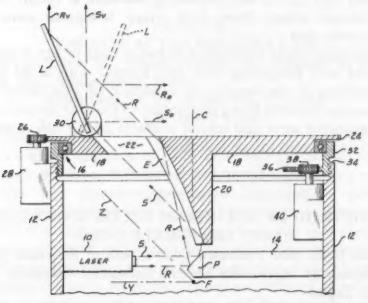
LASER TRACKING SYSTEM

Leon Feigin, Westport, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 58,523, July 27, 1979, abandoned. This application Sept. 25, 1972, Ser. No. 291,141

Int. Cl.[2] G02B *27/17*

U.S. Cl. 350—7 **1 Claim**



1. A laser tracking system including in combination a convex paraboloidal mirror having a first focus disposed on a first axis thereof, a concave ellipsoidal mirror having a second and a third focus disposed along a second axis thereof, means mounting the ellipsoidal mirror for rotation about a third axis, a laser providing a parallel beam of light having a fourth axis and a circular cross section of relatively small diameter, said laser being oriented and disposed such that the parallel beam is incident upon the paraboloidal mirror and reflected therefrom as a highly divergent conical beam of circular cross section having a fifth axis, the ellipsoidal mirror being disposed and oriented such that the third axis passes through the first and second foci and the first and second foci are approximately coincident, the second axis intersects the third axis at an acute angle, the first axis intersects the third axis at a predetermined angle which is not less than said acute angle nor greatly in excess of 90°, the fourth axis is parallel to the first axis and lies in the plane of the first and third axes, and the fifth axis is coincident with the third axis, and such that the diverging conical beam is incident thereon and reflected therefrom as a slightly convergent beam having a circular cross section of relatively large diameter for all rotational positions of said ellipsoidal mirror with respect to said paraboloidal mirror.

3,917,382

HIGHWAY TRAFFIC GUIDE DEVICE

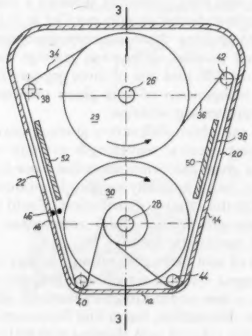
Mario Amann, Magnusstrasse 25, 896 Sankt Mang, Germany

Continuation-in-part of Ser. No. 362,762, May 22, 1973, abandoned. This application Aug. 1, 1974, Ser. No. 494,349

Claims priority, application Germany, May 25, 1972, 2225307

Int. Cl.[2] G02B *11/04, 5/12;* **E01F** *9/10*

U.S. Cl. 350—61 **10 Claims**

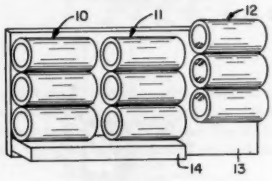


1. A highway traffic guide device comprising a hollow housing, at least one reflection element mounted in the housing, a transparent element arranged within the housing and including a section lying in front of the reflection element and exposed to atmospheric dirt accumulation, means supporting the transparent element for movement, drive means for moving the transparent element past said reflection element, control means for starting said drive means intermittently to move said section which is exposed to atmospheric dirt accumulation and replace it by an adjacent clean section of the transparent element, said control means comprising a measuring device arranged in the moving path of the exposed section of the transparent element to determine whether the dirt accumulation on the exposed section of the transparent element exceeds a predetermined value and to control the operation of the drive means in dependence on said determination.

3,917,383
OPTICAL WAVEGUIDE BUNDLE CONNECTOR

Thomas A. Cook; Marshall C. Hudson, both of Corning, and Jerome G. Racki, Painted Post, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Mar. 29, 1974, Ser. No. 456,185
Int. Cl.² G02B 5/16
U.S. Cl. 350—96 C **12 Claims**



1. An in-line connector for joining first and second bundles of optical waveguide fibers, said connector comprising:

first fiber supporting means having at least one fiber supporting surface, the end portions of the fibers of said first bundle being disposed in at least one line array on said fiber supporting surface of said first fiber supporting means, each fiber in said array being in contact with the fibers adjacent thereto, the endfaces of said first bundle of fibers lying in a plane that is substantially perpendicular to the axes of said first bundle end portions,

first array positioning means disposed at only one end of said fiber supporting surface of said first supporting means and in contact with an end fiber in said first array, the opposite end fiber in said first array remaining free from any array positioning means,

second fiber supporting means having at least one fiber supporting surface, the end portions of the fibers of said second bundle being disposed in at least one line array on said fiber supporting surface of said second fiber supporting means, each fiber in said array being in contact with the fibers adjacent thereto, the endfaces of said second bundle of fibers lying in a plane that is substantially perpendicular to the axes of said second bundle end portions, the cross-sectional shape of said at least one fiber supporting surface of said second fiber supporting means being a mirror image of that of said first fiber supporting means,

second array positioning means disposed at only one end of said fiber supporting surface of said second supporting means and in contact with an end fiber in said second array, the opposite end fiber in said second array remaining free from any array positioning means,

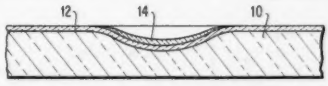
means for aligning said first and second fiber supporting means so that said first and second array positioning means are aligned and said at least one fiber supporting surface of said first and second fiber supporting means are aligned, whereby the fibers of said first line array are substantially aligned with corresponding fibers of said second line array, and

means for securing together said first and second fiber supporting means.

3,917,384
HIGH RESOLUTION LENSES FOR OPTICAL WAVEGUIDES

John S. Harper, Carmel; Eric G. Lean, Mahopac; Eberhard A. Spiller, Mt. Kisco, and Janusz S. Wilczynski, Ossining, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 11, 1973, Ser. No. 396,156
Int. Cl.² G02B 5/14
U.S. Cl. 350—96 WG **2 Claims**



1. An optical waveguide device comprising:

an optical waveguide substrate having a first index of refraction and having a spherical depression in one surface thereof,

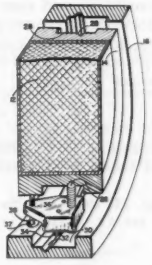
an optical waveguide having a second, higher index of refraction disposed on said substrate including said depression to form a spherical depression lens, and

a layer disposed over said depression lens and having an index of refraction greater than said second index of refraction whereby a combination spherical depression-waveguide index lens provides compensation for lens aberrations.

3,917,385
SIMPLIFIED MICROPOSITIONER

Robert L. Caswell, Placentia, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sept. 19, 1973, Ser. No. 398,731
Int. Cl.² G02B 7/02
U.S. Cl. 350—252 **9 Claims**



1. A positioning device comprising:

an outer ring;

an inner ring for supporting a device to be precisely positioned;

preload means interposed between said inner ring and said outer ring to produce a predetermined force relationship between said rings;

fixed stop means connected to said inner ring and said outer ring;

adjustable support means interposed between said inner ring and said outer ring; and

said adjustable support means including at least one pivot and an adjustable bearing means arranged such that the angular position of said adjustable support means can be adjusted about said pivot by adjusting said adjustable bearing means to establish the relative position of said rings.

3,917,386
DEVICES FOR IMPARTING A SCANNING MOTION TO MIRRORS AND THE LIKE

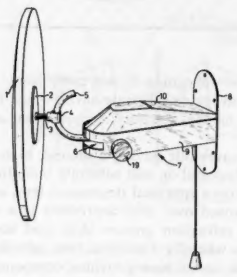
Staveley Graham Anderson Swales, Herons Close, Espley, near Norpeth, Northumberland, England

Continuation of Ser. No. 280,406, Aug. 14, 1972, abandoned. This application May 17, 1974, Ser. No. 470,976

Claims priority, application United Kingdom, Mar. 16, 1972, 12285/72; May 5, 1972, 21177/72

Int. Cl.[2] G02B *5/08*

U.S. Cl. 350—289 **7 Claims**



1. A mounting for imparting arcuate motion to a scanning member comprising: a stem which has a portion curved within a plane to define a concave side on said curved stem portion and a convex side on said curved stem portion, said stem having an essentially straight, base portion mounted for rotation about an axis substantially at a right angle to said straight base portion with the concave side of said curved portion facing the axis; an adjustable mounting member having means for supporting a scanning member on the convex side of said curved portion and being mounted for slidable displacement along and rotation about said curved stem portion whereby a scanning member carried by said stem may be universally adjusted; means for locking said mounting member in adjusted position on the stem; and a motor connected to rock said straight, base stem portion about said axis, through a plane essentially normal to said axis.

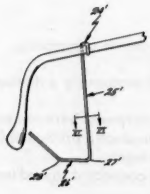
3,917,387
EYEGLASS RETAINER

Ernest Ensing, 1441 Sandy Point Ave., SE., Grand Rapids, Mich. 49506

Filed Mar. 21, 1974, Ser. No. 453,300

Int. Cl.[2] G02C *5/14*

U.S. Cl. 351—123 **10 Claims**



1. Eyeglass retainer means including a pair of retainer members adapted to attach to the temples of the eyeglasses and extend under the ears of the wearer, each retainer member comprising:

a wire-like stiffly deformable member having a first hook formed at one end for extending over the temple piece of a pair of glasses;

a shank extending from said first hook; and

a larger second hook formed at the opposite end of said member and lying in a plane substantially orthogonal to said first hook for fitting under and extending rearwardly of the ear of the wearer with said shank forward of the wearer's ear.

3,917,388
LENS SYSTEM

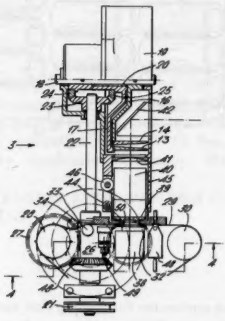
Victor Eckstein, Sydney, Australia, assignor to Ringprism Pty. Limited, Sydney, Australia

Filed Sept. 26, 1973, Ser. No. 400,865

Claims priority, application Australia, Oct. 4, 1972, 686/72; Oct. 4, 1972, 72/687

Int. Cl.[2] G03B *41/04*

U.S. Cl. 352—113 **9 Claims**



1. A film projector comprising a light source, a gate defining a gate opening having a length at least equal to that of two frames of the film to be projected, means to feed the film across the gate opening at a substantially constant speed, means for projecting light from said light source through said film at said gate opening, a ring prism comprising two concentric annular contra-rotatable ring prism elements, each element having a radially inner surface and a radially outer surface, one of said radially inner and said radially outer surfaces for each element being a right cylindrical surface and the other surface being disposed at an angle which varies around the circumference of the element, means to rotate said prism elements in opposite directions in synchronism with the motion of the film, lens means for directing the light beam which passes through said film towards said ring prism so that the beam travels through both ring prism elements in the radially inwards direction, and a fixed director element located within the volume which is bounded by the radially inner surface of the inside ring prism element for directing the beam of light from the projector.

3,917,389
MICROFICHE FILM PROJECTOR DEVICE

Akira Shoji, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 14, 1972, Ser. No. 225,976

Claims priority, application Japan, Feb. 22, 1971, 46-10320[U]; Feb. 22, 1971, 46-10321[U]; Feb. 22, 1971, 46-10322[U]

Int. Cl. G03b *23/08, 3/00*

U.S. Cl. 353—27 **3 Claims**

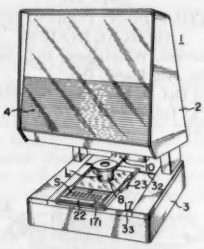
1. A microfiche film projector device comprising:

an illumination light source;

a projection surface; and

a microfiche film carrier having two transparent members for retaining a microfiche film therebetween, whereby said microfiche film is scanned by a fixed optical system; said microfiche carrier comprising a movable frame for

supporting said transparent members, a base frame for slidably supporting said movable frame in a scanning direction and shiftable in the direction opposite to said



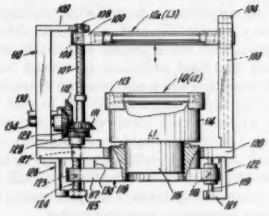
scanning direction, a mask member disposed adjacent to said film carrier and movable to indicate a desired portion of the image-bearing surface of the film to be projected, said mask being slidably mounted on said base frame.

3,917,390

EFFECTIVE FOCAL LENGTH ADJUSTING ADDITIONAL LENS SYSTEM FOR MULTISPECTRAL CAMERA-PROJECTOR

Anthony Wenderoth, Northport, N.Y., assignor to Spectral Data Corporation, Hauppauge, N.Y.

Filed Sept. 15, 1972, Ser. No. 289,442
Int. Cl.[2] G03B *3/02, 33/00*
U.S. Cl. 353—31 **1 Claim**



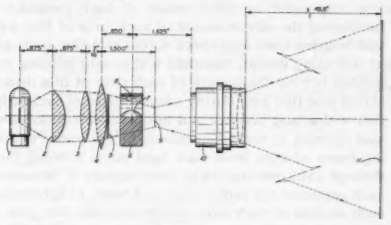
1. An additive color multispectral viewer including at least three illuminating bulbs each producing a light beam, a changeable filter in each light beam, means to hold three or more pictures in the same image plane, each picture being positioned in each light beam, at least three projector lens systems each positioned in one of said light beams, at least three auxiliary lens systems each being connected to one of said projector lens systems, and a screen whose distance from the means which holds the pictures is a fixed distance, each of said auxiliary lens systems including a mounting frame, a first convex lens fixed to said frame, a second convex lens adjustably mounted on said frame, and means to move said second lens relative to said first lens along its axis with a motion parallel to the axis only and without rotation, wherein said second convex lens and said projection lens system are each mounted on a bracket member, said frame has support shaft means connected thereto and each bracket member has at least two holes therethrough through which support shaft means protrude, at least one of said support shaft means is threaded and meshes with screw threads of a bracket hole, said threaded shaft means is rotatably connected to said frame, and means are connected to said threaded shaft to rotate said threaded shaft means so as to adjust the positions of the second convex lens and the projection lens system.

3,917,391

PROJECTION SYSTEM FOR MEASURING CURVES AND CROSS-SECTIONAL DIMENSIONS OF HYDROPHILIC CONTACT LENSES

Charles F. Padula, Southbridge, Mass.; Larry A. Spitzberg, San Rafael, Calif., and Richard A. Kilborn, Charlton City, Mass., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed May 2, 1974, Ser. No. 466,335
Int. Cl.[2] G01B *9/08*
U.S. Cl. 353—80 **1 Claim**



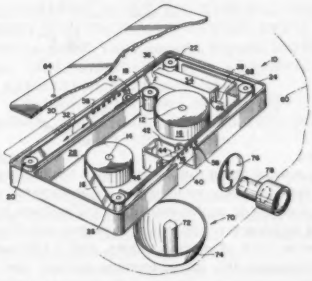
1. An optical projection system for viewing the contours of a transparent hydrophilic contact lens on a projection screen comprising a broad area light source and a projection screen, a transparent cell between the light source and the projection screen containing isotonic saline in which the transparent hydrophilic contact lens is immersed, a condenser lens system consisting of a plano-convex lens element and a biconvex lens between which an additional biconvex lens is placed, a light diffuser between the transparent cell and the condenser lens system whereby the light from said broad area light source is directed through the transparent cell, and a projection lens system between the cell and the screen for directing the light transmitted through the condenser lens system, the diffuser, the isotonic saline and the contact lens on to the screen.

3,917,392

UNIQUE PRISMATIC ELEMENT AND PROJECTION SYSTEM

Herbert A. Bing, Wayland, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 767,609, Oct. 15, 1968, abandoned. This application Feb. 25, 1971, Ser. No. 118,963
Int. Cl.[2] G03B *21/28*
U.S. Cl. 353—81 **10 Claims**



1. A compact motion picture film handling cassette configured to be mounted in a projector to facilitate film projection operations, such projector having means for forming a beam of light tending to converge at a point a given distance therefrom, comprising:

a housing having a pair of spaced apart substantially parallel external wall members connected together by a transverse external wall member adjacent juxtaposed edges thereof, one of said substantially parallel external wall members having an opening provided therethrough adjacent said transverse wall member, said transverse wall member being relatively short to provide a generally thin configuration to said housing and said housing defining a space in which a coiled strip of motion picture film may be initially positioned;

a film gate provided in said transverse wall member adjacent said opening;

means responsive to drive means of such projector for facilitating the advancement of such strip of film within said housing from said space across said film gate; and

light reflecting means, mounted within said housing to be located behind the section of such strip of film disposed across said film gate during advancement of such strip of film within said housing and in operative relationship to said opening to receive substantially the entire converging beam of light from such light beam forming means through said opening when said cassette is mounted in such projector, for redirecting such beam of light through such section of such strip of film and said film gate and for increasing the geometrical distance between such light beam forming means and the point at which such beam of light converges, said light reflecting means including a prism formed of a material having an index of refraction greater than air and having a first transparent face disposed to receive such beam of light and a second convex transparent face disposed adjacent such section of such strip of film to minimize the dimensions of said prism in the plane normal to said external wall members and thus permit the thickness of said housing to be minimized.

3,917,393

VARIOSLIT

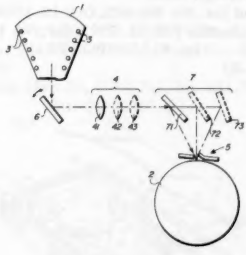
Dieter Nier, Monchen-Gladbach, Germany, assignor to Rank Xerox Ltd., London, England

Filed Aug. 30, 1974, Ser. No. 501,944

Claims priority, application Germany, Sept. 21, 1973, 2347622

Int. Cl.[2] G03B *3/02*

U.S. Cl. 353—101 **4 Claims**



1. An optical apparatus comprising a folded image-forming system for projecting an image of an illuminated object onto an image plane in a plurality of magnifications in which the angle of incidence of the image rays onto the image plane is different in each of magnifications, and a slit member positioned between the image-forming system and the image plane, characterized in that the slit member defines a slit the effective plane of which is inclined to the image plane such that the slit presents a different effective slit width to the image rays for each of the plurality of magnifications, the effective slit width being greatest for the greatest magnification and progressively smaller for correspondingly smaller magnifications, so that a substantially constant intensity of illumination is obtained at the image plane regardless of the magnification.

3,917,394

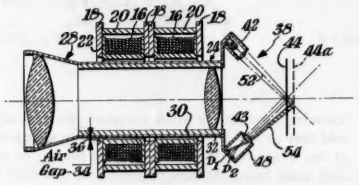
AUTOMATIC COMPONENT POSITIONING DEVICE FOR OPTICAL SYSTEM

Eugene J. Sturdevant, Wilmington, Del., assignor to Display Enterprises, Inc., Rockland, Del.

Filed Oct. 9, 1973, Ser. No. 404,271

Int. Cl.[2] G03B *3/02, 3/10;* **H02K** *41/00*

U.S. Cl. 353—101 **17 Claims**



1. An automatic component positioning device for an optical assembly having an object comprising a linear electric motor including a cylindrical field winding and a cylindrical armature mounted within said field winding for axial movement relative thereto, said component being connected to said armature to cause said component to be moved by said armature, a position detecting assembly for determining whether said component is disposed at a predetermined position relative to said object, a reversible drive circuit connected to said field winding, said reversible drive circuit having driving conditions and a null condition, a servo circuit connecting said position detecting means to said reversible drive circuit whereby said reversible drive circuit is constituted in said driving condition and said armature is caused to move it toward said null condition when said position detecting assembly determines that said component is not in said predetermined position whereby said component is repositioned at said predetermined position and said reversible drive circuit is reconstituted into said null condition, and said field winding is energized with DC currents switched into it in an appropriate sequence causing said variable reluctance motor to constitute a DC variable reluctance stepping motor.

3,917,395

CONTROL CIRCUIT FOR PHOTOGRAPHIC APPARATUS

Francis T. Ogawa, Lakewood, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed June 28, 1973, Ser. No. 374,691

Int. Cl.[2] G03B *7/08, 3/00, 15/05*

U.S. Cl. 354—23 D **6 Claims**

1. In an automatic photographic camera featuring a plurality of automatic functions, a control system for controlling the sequence and actuation of said automatic functions, said control system comprising:

means for producing a plurality of parametric signals representative of parameters related to said automatic functions,

a binary logic control circuit responsive to said parametric signals for producing a plurality of control signals,

said binary logic control circuit including means for establishing the selection and sequence of the actuation of said automatic functions,

means responsive to said control signals to effect the actuation of said automatic functions,

said control system including an automatic exposure control means for controlling the operation of the shutter of said camera.

said control means including an integrating light sensing means,

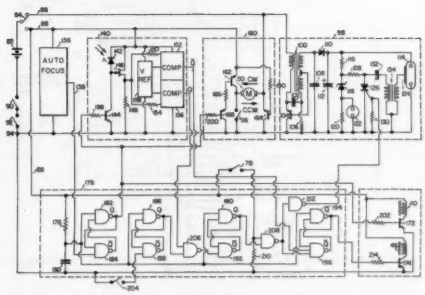
voltage reference means,

signal comparator means connected to said light sensing means and to said voltage reference means for producing one of said parametric signals as a function of the comparison of the outputs of said voltage reference means and said light sensing means,

said binary logic control circuit including gating means responsive to said one parametric signal for controlling the operation of the shutter of said camera,

said automatic functions including an automatically controlled electronic flash means, said automatic exposure control means including means for sampling the ambient light at a point in time early in the opening phase of the shutter of said camera,

means for producing a further parametric signal representative of the result of the sampling of said ambient light, and said binary logic control circuit includes means responsive to said further parametric signal to control the actuation of said electronic flash means, in accordance with the value of its ambient light whereby said electronic flash means is actuated to produce a flash whenever said ambient light is below a predetermined value and to block the actuation of said electronic flash means whenever the ambient light is above said predetermined value.



4. In an automatic camera featuring a plurality of automatic functions, a control system for controlling the sequence and actuation of said automatic functions, said control system including means for producing a plurality of signals representative of parameters relating to the operation of said camera, control circuit means responsive to said signals for producing a plurality of control signals,

said automatic functions including focussing control, exposure control and electronic flash producing means, and

means connected to be responsive to said cntrol signals for effecting adjustment of the focus of said camera, for effecting said automatic exposure control of said camera in accordance with the illumination of a scene to be photographed, and for effecting the control of the actuation of said electronic flash producing means in accordance with the value of the ambient light whereby said electronic flash producing means is enabled to produce a flash whenever the ambient light is below a predetermined value and to timely actuate said flash producing means.

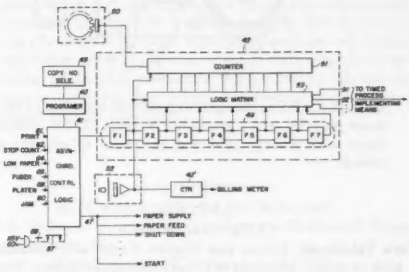
3,917,396
CONTROL SYSTEM

James M. Donohue, Rochester, and Daniel L. Mueller, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 244,734, April 12, 1972, Pat. No. 3,796,486, which is a continuation of Ser. No. 97,745, Dec. 14, 1970. This application Feb. 4, 1974, Ser. No. 438,972

Int. Cl.[2] G03G *15/00*

U.S. Cl. 355—14 **17 Claims**



1. A processing system for producing copies of an original having an endless movable photoreceptor belt including,

means for producing latent images on said belt,

development means for applying developing material to each of the latent images to develop the same,

a transfer station adjacent the moving belt,

means for feeding seriatim sheets of copy material at the rate of one sheet per actuation thereof from a supply thereof and to said transfer station at which each developed image is transferred to said sheets,

means for generating in equal cycles series of control pulses, said generating means including means associated with said image producing means and said sheet feeding means for controlling actuation of the latter in timed sequence relative to the production of each latent image by said image producing means for each of said cycles, wherein said generating means is a timing device, and

means responsive to the speed of movement of the belt for resetting each of said time cycles wherein said pulse generating means is arranged to respond to a preselected one of the processing steps that is dependent upon and related to the speed of the machine drive.

3,917,397
MECHANISM FOR REMOVING RESIDUAL TONER FROM ELECTROSTATIC COPIER DRUM

Susumu Tanaka, Sakai; Yuji Enoguchi, Higashi, and Hidetoshi Kawabata, Tondabayashi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 1, 1974, Ser. No. 456,992

Claims priority, application Japan, Apr. 2, 1973, 48-37967

Int. Cl.[2] G03G *21/00*

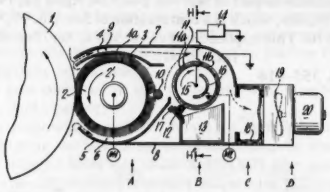
U.S. Cl. 355—15 **15 Claims**

1. A residual toner removing apparatus for use in removing toner from an electrophotosensitive member comprising:

a rotatably mounted cleaning brush (2) with the bristles (3) thereon moving in frictional contact with the surface of the electrophotosensitive member (1),

first (4, 7*a*) and second (5) casing members overlying a portion of said cleaning brush with said first casing member (4, 7*a*) in frictional rubbing contact with the bristles moving along a portion of the path of the periphery thereof so as to triboelectrically charge the bristles (3) to the same polarity as that of the toner, said second casing member (5) being spaced apart from the bristles so as to define an air flow path (6),

a rotatable sleeve member (11) mounted adjacent but spaced apart from said cleaning brush (2) for collecting toner recovered by said cleaning brush, said sleeve member having a corona electrode wire (15) running there-



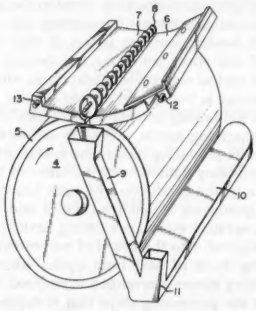
through for being charged to potential opposite to that of toner polarity, and a grounded housing (7) for collecting toner with polarity reversed in course of copying processes.

3,917,398

CLEANING DEVICE

Toru Takahashi, Tokyo, and Syujiro Kadowaki, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed July 17, 1974, Ser. No. 489,086
Claims priority, application Japan, July 20, 1973, 48-82031
Int. Cl.² G03G *21/00*
U.S. Cl. 355—15 **9 Claims**



1. A device for cleaning an image holding body for use in an electrophotographic copying machine, which comprises: a resilient cleaning blade having an edge in contact under pressure with the surface of the image holding body to scrape off developing agent remaining thereon; and a guide plate disposed on the surface of the image holding body, the guide plate being so adjustable as to bring one of its edges to a confronting position against the edge of the cleaning blade at the time when cleaning action is being carried out by the cleaning blade.

3,917,399

CATADIOPTRIC PROJECTION PRINTER

M. John Buzawa, Rochester, and Charles R. Munnerlyn, Fairport, both of N.Y., assignors to Tropel, Inc., Fairport, N.Y.

Filed Oct. 2, 1974, Ser. No. 511,219
Int. Cl.² G03B *27/52, 27/70;* G01J *4/00;* G01B *11/26*
U.S. Cl. 355—43 **15 Claims**

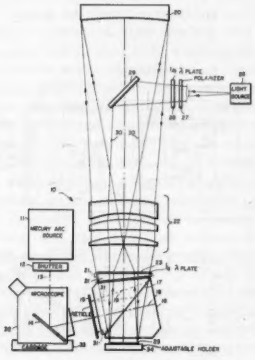
1. In a projection printer for printing a circuitry pattern from a reticle onto a wafer and including an ultra violet source of radiant energy, a beam splitter, a focusing mirror and means for mounting and optically registering said reticle and said wafer respectively in input and output regions of said beam splitter, the improvement comprising:

a. said beam splitter is a polarizing beam splitter directing a polarized portion of said radiant energy toward said focusing mirror;

b. means between said polarizing beam splitter and said focusing mirror for altering said polarization of said radiant energy so said polarization of said radiant energy reflected from said focusing mirror is oriented to pass straight through said polarizing beam splitter to said wafer;

c. a multi-element corrective lens arranged between said polarizing beam splitter and said focusing mirror for correcting chromatic and spherical aberration, astigmatism and field curvature and directing said radiant energy reflected from said focusing mirror substantially telecentrically onto said wafer;

d. said polarizing beam splitter, said polarization altering means and said lens being selected for substantially transmitting said radiant energy throughout the near ultra violet and visible spectrum;



e. said optical registering means including a source of polarized visible radiant energy and a microscope arranged for observing said reticle;

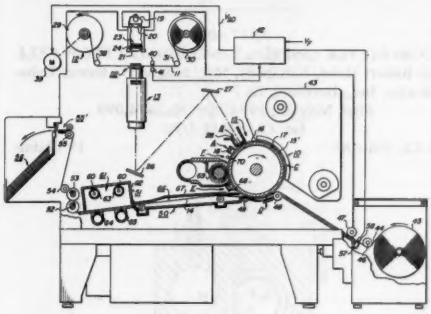
f. means for directing said polarized visible radiant energy toward said polarizing beam splitter to pass through said polarization altering means so the polarization of said visible radiant energy is oriented to pass straight through said polarizing beam splitter to be substantially telecentrically incident on said wafer, said visible radiant energy being reflected to said focusing mirror from said wafer and said visible radiant energy reflected back from said focusing mirror being oriented by said polarization altering means to be split by said polarizing beam splitter for imaging said wafer on said reticle for viewing through said microscope; and

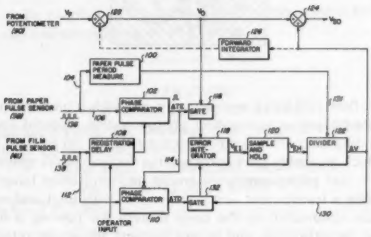
g. adjustable means for varying the optical length of the path between said focusing mirror and said wafer to accommodate different wavelengths of said radiant energy from said ultra violet source and said source of visible radiant energy.

3,917,400
METHOD AND APPARATUS FOR MAINTAINING A PREDETERMINED PHASE RELATIONSHIP BETWEEN TWO SIGNALS

Victor Rodek, Rochester, N.Y.; Lauren V. Merritt, Sierra Madre, Calif., and Guillermo F. Luzio, Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 13, 1973, Ser. No. 424,529
Int. Cl. G03b *27/48*
U.S. Cl. 355—50 **17 Claims**





4. Apparatus for printing prerecorded information comprising:

a filmstrip bearing said prerecorded information and first uniformly spaced sense markings distributed along the length thereof,

a web bearing second uniformly spaced sense markings distributed along the length thereof,

filmstrip driving means mechanically coupled to the said filmstrip for driving said filmstrip at a controllable velocity,

web driving means mechanically coupled to said web for driving said web at a constant velocity,

first detecting means fixedly disposed relative to said filmstrip for detecting the passage of each of said first uniformly spaced sense markings through a predetermined position and for generating a first periodic signal in response to each detected sense marking whereby the frequency of said generated signals is representative of the velocity of said filmstrip,

second detecting means fixedly disposed relative to said web for detecting the passage of each of said second uniformly spaced sense markings through a second predetermined position and for generating a second periodic signal in response to each detected sense marking, the frequency of said generated signals being representative of the velocity of said web,

means coupled to said first detecting means for delaying said first periodic signal,

comparison means coupled to said delaying means and said second detecting means for generating signals indicative of the initial phase error between said first periodic signal and said delayed second periodic signal,

means coupled to said comparison means for producing an output signal which is related to said phase error,

means coupled to said producing means for generating a control signal,

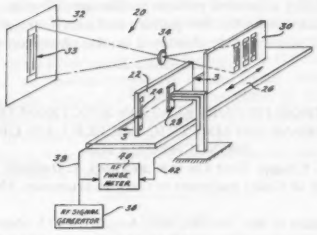
means responsive to said control signal for driving said filmstrip driving means whereby said phase error is reduced towards substantially zero, and

means coupled to said producing means for modifying the output of said control signal generating means if said phase error signal has not been reduced to substantially zero by said filmstrip driving means at the time a succeeding phase error signal is to be generated, the succeeding signal indicative of phase error being compensated for the initial phase error correction being made by said driving means during the time period said succeeding phase error signal is to be generated.

3,917,401
STEP AND REPEAT CONTROLLER

Carl F. Stolwyk, St. Louis, Mo., assignor to McDonnell Douglas, St. Louis, Mo.

Filed Nov. 15, 1974, Ser. No. 523,970
Int. Cl.[2] G03B *27/42*
U.S. Cl. 355—53 **22 Claims**

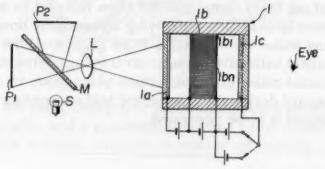


1. Means for locating electrode image positions on a photomask to be used in the construction of acoustic surface wave devices comprising an acoustic surface wave device having a surface over which signals are propagated, an input transducer located on said surface, means connected to excite said input transducer to propagate a signal therefrom over the surface, means for sensing a propagated signal at different locations on the surface including a sensor member movable relative to the surface, other means forming a photomask and means fixedly connecting the photomask to the surface wave device for movement therewith relative to the sensor member, camera means including means for exposing the photomask to an image to be formed thereon, circuit means having separate input connections to the sensor member and to the input transducer, said circuit means including means for indicating a predetermined relationship between the signal applied at the input transducer and the propagated signal as sensed at different locations by the sensor member, said last named means including means for establishing different positions on the photomask for exposure to the camera means, said different positions establishing positions for exposing the photomask to the optical image.

3,917,402
METHOD AND APPARATUS FOR COLLATING PATTERNS

Wasaburo Ohta, Yokohama, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed June 17, 1974, Ser. No. 480,298
Claims priority, application Japan, June 29, 1973, 48-74073
Int. Cl.[2] G06K 5/00
U.S. Cl. 356—71 6 Claims

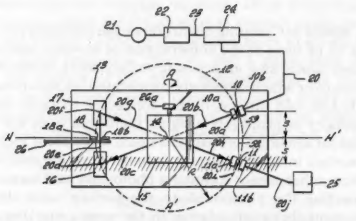


1. A method of collating patterns comprising the steps of feeding a first pattern to an image amplifier having a channel plate generating secondary electrons at areas corresponding to a pattern fed to the image amplifier and having an output phosphor screen to produce a scintillation image of said secondary electrons, applying a controlled voltage to the amplifier to prevent groups of the secondary electrons generated within the channel plate of the amplifier from reaching the phosphor screen, removing said controlled voltage from the amplifier while secondary electrons generated within the channel plate remain within the channel plate, and concurrently feeding a second pattern to the amplifier to cause a region which lies on the first pattern and which does not lie on the second pattern to be displayed on the phosphor screen.

3,917,403
METHOD OF CORRELATION SPECTROSCOPY UTILIZING AN ASYMMETRIC DOUBLE PASS GRATING MONOCHROMATOR

Vernon L. Chupp, West Covina, and Jack J. Duffield, Monrovia, both of Calif., assignors to Cary Instruments, Monrovia, Calif.

Continuation of Ser. No. 391,605, Aug. 27, 1973, abandoned, which is a division of Ser. No. 230,434, Feb. 29, 1972, Pat. No. 3,775,010. This application July 29, 1974, Ser. No. 492,499
Int. Cl.[2] G01J 3/18
U.S. Cl. 356—74 3 Claims



1. In the performance of correlation spectroscopy utilizing a zero dispersion monochromator that includes entrance, intermediate and exit slits, a ruled grating in the beam path between the entrance and exit slits and operable to disperse a beam of radiation incident thereon both prior and subsequent to radiation passage through the intermediate slit, means to rotate the grating about a first axis which is parallel to the grating rulings, the entrance and exit slits symmetrically disposed at opposite sides of a plane bisecting and normal to a line extending between the entrance and exit slits, the plane also passing through the intermediate slit, the steps that include

a. locating said axis to have intersection with and to extend at an angle Ψ relative to a normal to said plane that passes through said intersection, thereby to substantially eliminate spectral overlap,

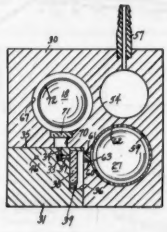
b. locating an array of sets of slits adjacent the intermediate slit position of the monochromator, and

c. effecting successive location of the slits in the array into the focal plane of said intermediate slit position.

3,917,404
FLUOROMETER ASSEMBLY INCLUDING A FLOW CELL

Louis Robert Heiss, Annapolis, Md., assignor to Baxter Laboratories, Inc., Deerfield, Ill.

Filed May 28, 1974, Ser. No. 474,099
Int. Cl.[2] G01J 3/30
U.S. Cl. 356—85 19 Claims



1. A flow cell block assembly for use with a photometer of the type having an upstanding photosensitive element and an upstanding excitation lamp adjacent to each other, said flow cell block assembly having respective vertical bores spaced to receive said photosensitive element and excitation lamp and including a transparent vertical flow cell with inlet and outlet conduits connected to the ends thereof for passing a liquid sample therethrough, and means to exert adjustable retaining force on the top end of said flow cell, said block assembly being formed with passage means at right angles and leading respectively from the excitation lamp bore to the flow cell and from the flow cell to the photosensitive bore.

3,917,405
FLAME PHOTOMETRIC DETECTOR EMPLOYING PREMIXED HYDROGEN AND OXYGEN GASES FOR SAMPLE COMBUSTION WITH END-ON SPECTROPHOTOMETER VIEWING OF THE FLAME

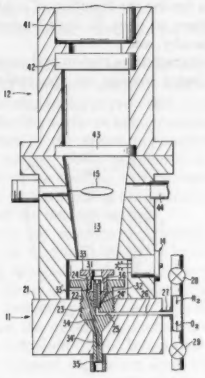
Charles Harold Hartmann, Moraga, and Richard Brandt DeLew, Corte Madera, both of Calif., assignors to Varian Associates, Palo Alto, Calif.

Filed Mar. 8, 1972, Ser. No. 232,925
Int. Cl.[2] G01J 3/30
U.S. Cl. 356—87 7 Claims

1. A flame photometric detector for the quantitative and qualitative detection of phosphorus and sulfur comprising a burner means including a combustion chamber extending in an axial direction a flame being produced, in operation, by the combustion of a mixture of a fuel gas and combustion supporting gas, said burner means including a flame tip, said burner means further including a first passageway and a second passageway, said first passageway to deliver said mixture of said fuel gas and said combustion supporting gas to said flame tip where combustion thereof forms a reducing flame and said second passageway being separated from said first passageway for delivering said sample to the cooler peripheral region of said reducing flame, and

a photodetector means responsive to the photoemission of said phosphorus and said sulfur from said flame for quali-

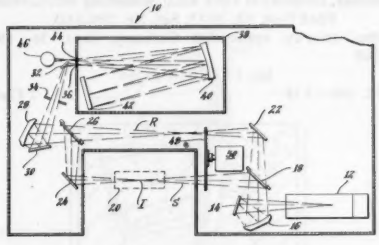
tative and quantitative detection thereof, said photodetector means being mounted with its optical axis substantially parallel to the axis of said burner means to obtain an end-on sighting of said flame.



3,917,406
OPTICAL BEAM SPLITTER

E. Horace Siegler, Jr., Darien, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Sept. 16, 1974, Ser. No. 506,266
Int. Cl.² G01J *3/42*; G02B *27/14*
U.S. Cl. 356—88 **8 Claims**

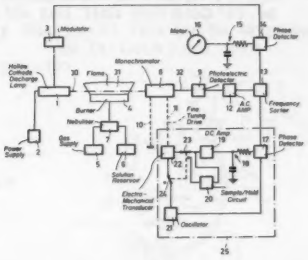


1. In an optical measuring instrument including a source of radiation, means for forming a first beam of said radiation, a first beam splitter positioned in said first beam to form a sample beam and a reference beam, a second beam splitter, means for directing said sample and reference beams onto said second beam splitter to form a recombined beam, and means for analyzing said recombined beam, the improvement which comprises: each of said beam splitters having alternating reflecting and transmitting stripes, the projections of the stripes of said first beam splitter onto a plane normal to the optical axis being substantially orthogonal about the optical axis to the corresponding projections of the stripes of said second beam splitter.

3,917,407
SPECTROPHOTOMETER WITH AUTOMATICALLY FINE TUNED MONOCHROMATOR

Ronald Alfred Newstead, Cambridge, England, assignor to Pye Ltd., Cambridge, England

Filed Nov. 8, 1973, Ser. No. 414,110
Claims priority, application United Kingdom, Nov. 30, 1972, 55340/72
Int. Cl.² G01J *3/18*, *3/42*
U.S. Cl. 356—97 **8 Claims**

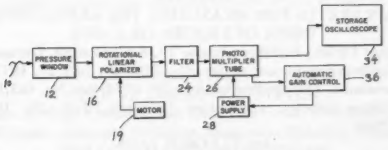


1. An atomic spectrophotometer including a monochromator, a detector responsive to the radiation beam coming from an exit slit of the monochromator to generate an electric output, and an arrangement capable of automatically fine tuning the monochromator wavelength when a selected spectral line has been positioned at least partly within said exit slit, said arrangement including an electromechanical transducer for adjusting the monochromator wavelength, a d.c. amplifier for biasing the transducer, an electrical oscillator for cyclically driving the transducer at a predetermined frequency to produce a signal component at said frequency in the output of the detector, and means responsive to said signal component for changing the input level of the d.c. amplifier in the direction which tends to reduce the amplitude of the signal component at said frequency, thereby adjusting the bias on the transducer to a value at which the selected spectral line is centered on the monochromator exit slit.

3,917,408
NAVIGATION AID

William J. Stachnik, New London, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 12, 1973, Ser. No. 334,174
Int. Cl.² G01J *4/02*
U.S. Cl. 356—116 **6 Claims**



1. An underwater polarimeter system comprising:
a water tight housing having a transparent window;
a light analyzer mounted in said housing, said analyzer being rotatable in a first plane at a first rotational frequency and also being in communication with said transparent window;
a photomultiplier housing in said housing and coupled to the output of said analyzer;
means for biasing said photomultiplier;
means for displaying the output of said photomultiplier; and
means for rotating said housing in a second plane gener-

ally perpendicular to the first plane of rotation of said analyzer at a second rotational frequency substantially smaller than the first rotational frequency of said rotational analyzer.

3,917,409

OPTICAL APPARATUS FOR DETERMINING FOCUS

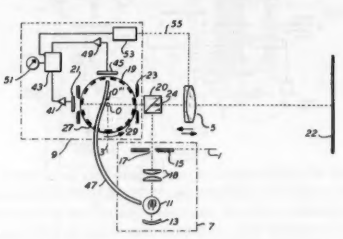
Paul T. Kaestner, 246 Bay Ave., Huntington Bay, N.Y.

Filed June 26, 1972, Ser. No. 266,270

The portion of the term of this patent subsequent to Sept. 4, 1990, has been disclaimed.

Int. Cl.[2] G01B *9/00*; G01C *3/08*

U.S. Cl. 356—125 **13 Claims**



1. A device for determining the position of optimum focus and the focus of an optical member;

light beam transmitter means, for transmitting a beam of light substantially perpendicular to the optical axis of the optical member, having an object plane;

deflection means for deflecting a portion of the beam of light so that it travels along the axis of the optical member and through the optical member;

a mirror positioned along the optical axis for reflecting said portion of light back through the optical member;

receiving means having a target image plane including:

means comprising a grid member having alternating slots and bars, movable in a path substantially transverse to the optical axis of the optical member, to provide an output signal including a repeated fluctuating light flux pattern having a phase corresponding to the focus of the optical member and to the direction of the optical member is displaced from the predetermined point of optimum focus;

said transmitter means being fixed in position with respect to the receiving means and with respect to the object and target image planes of the transmitter and receiving means, and positioned on the same side of the lens as the receiving means.

3,917,410

APPARATUS FOR MEASURING THE REFRACTIVE INDEX OF LIQUIDS OR GASES

Helmut Ulrich, Waldhornstrasse 27, 8 Munich 50, Germany

Continuation-in-part of Ser. No. 275,729, July 27, 1972, abandoned. This application Apr. 29, 1974, Ser. No. 465,155

Claims priority, application Germany, July 28, 1971, 2137842

Int. Cl.[2] G01N *21/46*

U.S. Cl. 356—133 **12 Claims**

1. Apparatus for measuring the refractive index of fluids contained in a fluid retainer, comprising:

a means forming radiation transmitting region;

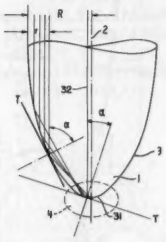
a means forming radiation receiving region;

a source of radiation coupled to said radiation transmitting region;

a radiation sensitive means coupled to said radiation receiving region;

a light conductor having a surface generated by rotation of a curve having a progressively decreasing radius of curvature about an axis of rotation, whereby said surface merges into a substantially-rounded, vertex-tip, measuring, surface area without the radius of surface curvature becoming zero at said vertex-tip, measuring, surface area, said surface defining a single radiation input and output window at an intersection of said surface with a plane normal to said axis of rotation, said vertex-tip, measuring, surface area having the function of contacting said fluids in said retainer to have its light transmitting properties modified thereby; and

said radiation transmitting region and said radiation receiving region being located on the opposite side of said



window from said vertex-tip measuring-point surface area, and on substantially diametrically opposite sides of a center of said window, said radiation transmitting region radiating light through said window toward said vertex-tip measuring-point surface area and said radiation receiving region receiving light passing through said window from said vertex-tip measuring-point surface area, such that said radiation transmitting region and said radiation receiving region thereby being arranged that said radiation sensitive means receives predominantly light which is reflected from said vertex-tip measuring-point surface area.

3,917,411

APPARATUS FOR MEASURING THE DENSITY OF A LIQUID UTILIZING REFRACTION

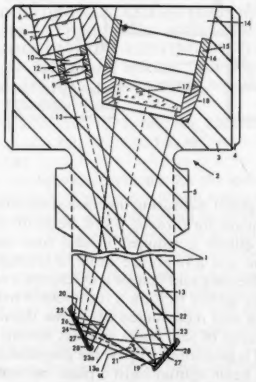
Walter Schweizer, and Martin-Ulrich Reissland, both of Berlin, Germany, assignors to VDO Adolf Schindling AG, Germany

Filed Sept. 12, 1973, Ser. No. 396,560

Claims priority, application Germany, Sept. 26, 1972, 2247048

Int. Cl.[2] G01N *21/46*

U.S. Cl. 356—135 **2 Claims**



1. An apparatus for continuous measurement of the density of a liquid within prespecified limits by using the law of refrac-

tion, the apparatus being particular suitable for measurement of the electrolyte concentration in a storage battery of a motor vehicle to determine its charge, the apparatus comprising:

A. a light-conductive rod having one end for immersion in said liquid and a second end for handling, the rod being adapted to conduct a pencil of rays along a beam path, the rod further comprising:

A1. a measuring surface arranged on said one end of the rod,

A2. a limiting surface on said one end and positioned substantially perpendicularly to said beam path,

A3. two deflecting surfaces provided on said one end, one of the deflecting surfaces being positioned in the beam path upbeam of the measuring surface and the other deflecting surface being positioned in the beam path downbeam of the limiting surface, and

A4. a groove with a slanting base between the measuring surface and the limiting surface,

B. a light source for emitting said pencil of substantially parallel rays as a beam along said beam path, the light source being situated at said second end of the rod for directing the beam toward the measuring surface via said one of the deflecting surfaces, whereby the beam is adapted, when the measuring surface is immersed in the liquid, to be refracted by the measuring surface into the liquid by an amount dependent upon the density of the liquid and then to be directed toward the limiting surface, after which it strikes and is deflected by said other deflecting surface, and

C. a photosensitive element situated at said second end and placed to intercept the beam which is deflected by said other deflecting surface, whereby the direction of the beam toward the photosensitive element is varied as a function of the density of the liquid.

3,917,412

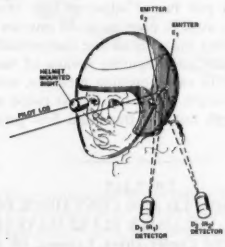
ADVANCED HELMET TRACKER USING LATERAL PHOTODETECTION AND LIGHT-EMITTING DIODES

Ronald G. Stoutmeyer, and William O. Alltop, both of China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 11, 1972, Ser. No. 243,085

Int. Cl.[2] G01B *11/26*

U.S. Cl. 356—152 **5 Claims**



1. An optical tracker system for determining the position and orientation of an operator's headgear, comprising:

a sight that is independent of said operator's eye movement mounted on said headgear;

first illuminating means coupled to said operator's headgear for movement therewith, for providing illumination;

second illuminating means coupled to said operator's headgear for movement therewith, for providing illumination;

first photodetecting means system-spatially fixed for detecting the illumination of said first and second illuminating means and providing outputs in response thereto;

second photodetecting means system-spatially fixed for detecting the illumination of said first and second illuminating means and providing outputs in response thereto;

such that the outputs of said first and second photodetecting means indicate the position and orientation of said headgear and, thereby, the operator's line-of-sight.

3,917,413

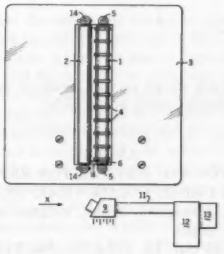
CHROMATOGRAPHIC COLUMN SCANNING APPARATUS

Lee A. Gorman, Florissant, and Thomas R. Romer, Maplewood, both of Mo., assignors to Ralston Purina Company, St. Louis, Mo.

Filed July 17, 1974, Ser. No. 489,193

Int. Cl.[2] G01N *21/00, 31/08*

U.S. Cl. 356—197 **6 Claims**



1. A chromatographic scanning apparatus comprising the following combination:

a. A support surface coated to minimize light reflectance;

b. A rotatable element and drive means to rotate said element both being attached to said support surface, said rotatable element having its axis of rotation parallel to the support surface;

c. A chromatographic column;

d. Means for retaining said column in parallel rolling contact with said rotatable element;

e. A spectrophotometric device having a light source directed towards the rounded surface of the column.

3,917,414

OPTICAL INSPECTION SYSTEM

James D. Geis, Cheshire, and Henry R. Cofek, Fairfield, both of Conn., assignors to Geisco Associates, Cheshire, Conn.

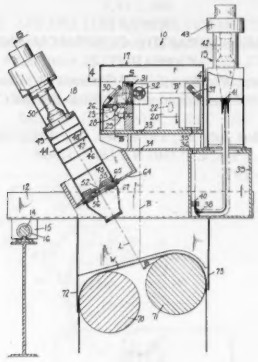
Filed Oct. 11, 1973, Ser. No. 405,449

Int. Cl.[2] G01N *21/32*

U.S. Cl. 356—200 **26 Claims**

1. An optical inspection system comprising means providing a beam of light energy repetitively sweeping laterally across a length of web material, photodetector means responsive to changes in light on said web due to discontinuities therein and providing a pulse-like signal in response thereto, means responsive to the beam and movement of said beam across the web for generating a train of pulses where each pulse is representative of a succeeding incremental position of the beam on the web whereby the instantaneous position of the beam on the web is indicated by the number of pulses generated, a

storage register, and means for applying said pulse-like signals to said storage register in synchronism with the pulses of said



train during each sweep of said beam to record the lateral location of a discontinuity in the web.

3,917,415

APPARATUS AND METHOD FOR REPRODUCING RECORDED COLOR VIDEO SIGNALS

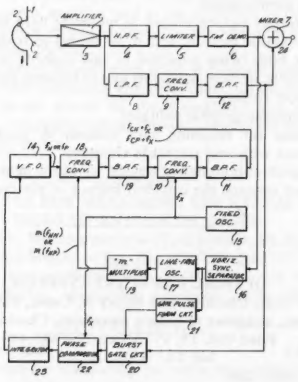
Takeo Eguchi, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 16, 1974, Ser. No. 515,309

Claims priority, application Japan, Oct. 16, 1973, 48-116229

Int. Cl.[2] H04N *5/76, 9/42*; **H04B** *1/26*

U.S. Cl. 358—4 **13 Claims**



1. An apparatus for selectively reproducing color video signals having luminance and chrominance components and which have been recorded on respective record media with different line frequencies and with different color sub-carrier frequencies for the respective chrominance components; comprising means for reproducing video signals recorded on a selected one of said record media, means for separating the luminance and chrominance components of the reproduced video signals, frequency converting means receiving the separated chrominance component of said reproduced video signals, fixed oscillator means for providing a first signal with a predetermined fixed frequency, means for providing a second signal with a frequency which is a predetermined multiple of said line frequency of the video signals being reproduced, a variable frequency oscillator, means controlling said variable frequency oscillator to provide from the latter a third signal with a frequency which is the difference between the color sub-carrier frequency of the chrominance component of the reproduced video signals and said predetermined multiple of the line frequency, and means for applying said first, second and third signals to said frequency converting means so that the latter converts the color sub-carrier frequency of said separated chrominance component of the reproduced video signals to said predetermined fixed frequency irrespective of said color sub-carrier frequency as recorded.

3,917,416

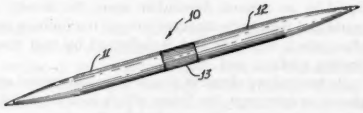
MULTICOLOR BALL-POINT PEN CONSTRUCTION

Ann Steyer, 20 S. St. Joseph, Joliet, Ill. 60436

Filed Jan. 21, 1974, Ser. No. 435,200

Int. Cl.[2] B43K *27/12*

U.S. Cl. 401—34 **2 Claims**



1. A pen construction comprising in combination: first and second pen barrels each of a first predetermined length and each having exposed points at one end and eraser-holding means at the other end thereof, an eraser secured within said eraser-holding means of each pen barrel, said eraser and said eraser-holding means combining to form a second predetermined length substantially less than said first predetermined length of said pen barrels, securing means formed integral with said eraser-holding means, said first and second pen barrels each include an end barrel formed adjacent said eraser-holding means, an ink cartridge secured within said pen barrels, each ink cartridge having a non-uniform end in abutment with the end wall of said pen barrel, and an aperture formed within said pen barrel adjacent said eraser-holding means to provide an air flow passage to the interior of said pen barrels, and a coupling member having diametrically opposed ends engageable with said securing means of said first and second pen barrels to said coupling member, said coupling member having a length equal to at least twice said second predetermined length but less than said first predetermined length.

3,917,417

COMBINATION MOULD AND CONTAINER-DISPENSER FOR HIGH-VISCOSITY FLUID MATERIAL

Frank J. Lang, 11702 Center Drive, Lemont, Ill. 60439

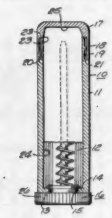
Filed July 16, 1973, Ser. No. 379,555

Int. Cl.[2] A45D *40/06*

U.S. Cl. 401—72 **3 Claims**

1. A dispenser-container for fluid material of relatively high viscosity at room temperature, including a body portion, a cap detachably connected to said body, and a combination screw-base rotatably connected to one end of said body, said body being a hollow tube, said cap being generally cup-shaped and adapted easily to snap on and off the other end of said body and having a hollow interior which extends axially beyond the end of the body, the inner diameter of that portion of said cap which extends beyond the end of said body when operatively connected thereto being no greater than the inner diameter of the tubular body and forming with said body a mould for said fluid material, said screw-base having a threaded portion

including a shaft and a spiral thread and a knob-portion separated from the threaded portion by a shoulder, said spiral thread being arranged directly to contact and move the fluid material without any intervening elevator or follower plate, the tubular body being shaped internally so that at least one



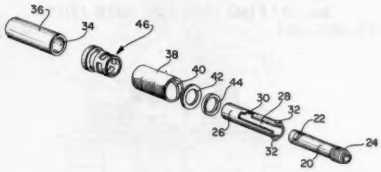
portion along the axis thereof is non-circular in crosssection, said spiral thread having an outer diameter substantially greater than the diameter of the shaft but smaller than the smallest dimension across the internal surface of the tubular body portion.

3,917,418

RESILIENT BUSHING FOR WRITING INSTRUMENTS AND THE LIKE

Louis A. Lanoie, East Greenwich, R.I., assignor to Garland Industries, Inc., Coventry, R.I.

Filed Jan. 20, 1975, Ser. No. 542,414
Int. Cl.² B43K *24/06*
U.S. Cl. 401—116 **5 Claims**



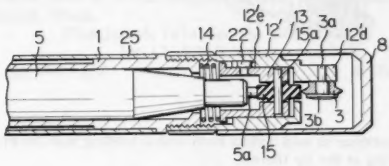
1. In a writing instrument of the type wherein a spiral collar is mounted for rotation over a fixed cylindrical stem member having a longitudinally extending slot therein, and wherein a carrier member is freely carried within said stem member, said carrier having a lug extending through said slot and making driving engagement with said spiral collar whereby rotation of the latter causes said carrier to propel or repel a writing cartridge connected thereto, the improvement comprising means carried by said stem member for imparting a frictional drag against rotation of said spiral collar, said means comprising a resilient bushing engaging at least one end of said spiral collar, said bushing comprising a cylindrical body freely and concentrically positioned on said stem with one end of said body engaging said collar, said body having an open portion in its cylindrical wall permitting axial compression of said bushing, and means on said stem axially compressing said bushing against said collar to impart a resilient thrust thereagainst, and means on said stem at the opposite end of said collar resisting said thrust.

3,917,419

HAND OPERATING DEVICE FOR DRAWING A LINE

Toshimi Kumakura, and Takashi Hosoyama, both of Tokyo, Japan, assignors to Kabushikikaisha Itoya, Tokyo, Japan

Filed June 28, 1974, Ser. No. 484,278
Claims priority, application Japan, Apr. 25, 1974, 49-46015; Apr. 25, 1974, 49-46016
Int. Cl.² B43M *11/02*
U.S. Cl. 401—218 **6 Claims**



1. In a device for drawing a line having an elongated hollow holder, an ink tank provided within said holder and having an ink supplying portion at its one end, a rotatable ink roller provided within said holder with its periphery being adapted to slidingly contact with said ink supplying portion of said ink tank so as to be supplied with an appropriate amount of ink therefrom as said ink roller is rotated and an applicator roller rotatably supported at one end of said holder with its periphery being adapted to rollingly contact with the periphery of said ink roller so as to be supplied with an appropriate amount of ink from said ink roller for permitting a line to be drawn on a sheet as said applicator roller is rollingly contacted with said sheet to thereby rotate said ink roller, the improvement wherein said ink tank is freely shiftably located in said holder so that said ink supplying portion is urged against said ink roller by the action of gravity of said ink tank when said holder is positioned in upstanding position for drawing a line with said applicator roller being located at lowermost position contacting said sheet, and said applicator roller is rotatably supported by a cantilever shaft mounted on said one end of said holder thereby facilitating the line drawing operation, and wherein further, said ink roller is shiftably located within said holder in the direction of the longitudinal axis thereof, a single spring also being provided within said holder so as to urge said ink roller in the longitudinal direction toward said applicator roller so as to thereby facilitate the maintenance of an appropriate amount of contact pressure between said ink roller and said applicator roller for transmitting an appropriate amount of ink from said ink roller to said applicator roller, while said ink supplying portion of said ink tank is also urged against said ink roller by the action of gravity of said ink tank during the line drawing operation, said ink tank, said ink roller, and said applicator roller being substantially aligned in the longitudinal direction of said holder.

3,917,420

DISPOSABLE TOOTHBRUSH

George W. Watson, 2159 Downington Ave., Salt Lake City, Utah 84108

Filed Oct. 23, 1973, Ser. No. 408,506
Int. Cl.² A46B *11/02*
U.S. Cl. 401—286 **5 Claims**

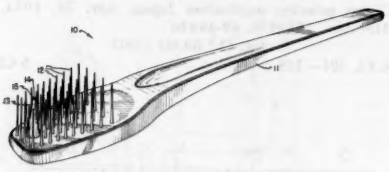
1. A disposable toothbrush comprising

a substantially rigid handle;

pliant bristles projecting from one end of one face of the handle;

a pliant dentifrice holder and dispenser formed as one piece projecting from the said face of the handle, between the bristles, said holder and dispenser having a hollow body closed by the said face of the handle and a tip substan-

tially on a plane with tips of the bristles and a small opening through the tip into the hollow body; and



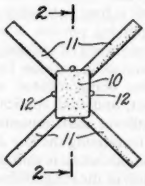
dentifrice in said hollow body and extending into the opening at the tip thereof.

3,917,421

INSERT FOR ATTACHING FIBERGLASS TOOL HANDLES

Joseph Allen Carmien, Beverly Hills, and John R. Yuhos, Van Nuys, both of Calif., assignors to Nupla Corporation, Sun Valley, Calif.

Filed May 28, 1974, Ser. No. 473,724
Int. Cl.[2] B25G *3/34*; **F16B** *11/00, 12/04*; **F16L** *41/00*
U.S. Cl. 403—12 **7 Claims**



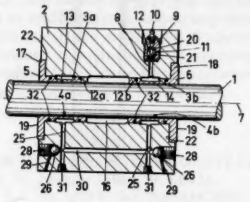
1. An insert for use in attaching a tool handle of fiberglass or the like to a tool head having a handle receiving opening, said insert being adapted to hold said handle temporarily in a fixed position with respect to said tool head during the curing of potting compound within said opening which forms a permanent bond between said handle and tool head, said insert being formed of a single piece of molded resilient material, said insert comprising a flat solid center portion having a peripheral configuration substantially corresponding to the peripheral configuration of the head carrying end of said handle, and a plurality of legs each connected at one end thereof to said center portion, said legs extending radially outwardly from said center portion in the same plane as said center portion prior to insertion of said insert into said handle receiving opening, said insert being movable into said opening by the end of said handle when said handle is inserted into said opening, said legs engaging the inner walls of said opening and being bent at a right angle along the area of their connection to said center portion, so that said legs extend parallel to said handle between the inner side walls of said opening and the outer side walls of said handle, said legs resiliently engaging the adjacent sides of said handle and opening to hold said handle in position with respect to said tool head.

3,917,422

DEVICE FOR CENTERING A ROTARY TOOL BODY ON A DRIVE SHAFT

Otto Betzler, Tauberbischofsheim, Germany, assignor to Michael Weinig KG, Tauberbischofsheim, Germany

Filed Aug. 2, 1974, Ser. No. 494,343
Claims priority, application Germany, Aug. 17, 1973, 2341663
Int. Cl.[2] F16D *1/06*; **B27G** *13/00*
U.S. Cl. 403—15 **18 Claims**



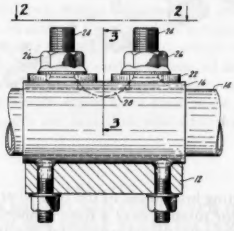
1. A rotary tool member, especially for wood working machines, and adapted for mounting on a drive shaft; said tool member comprising a body having a central bore therethrough, sleeve means in said bore having an internal axial hole of uniform diameter for receiving the shaft, said sleeve means having axially spaced regions of sealing engagement with the bore in the body to define with the bore an annular chamber, said sleeve means comprising at least one radially deformable axial portion between said spaced regions, and means connected to said chamber for supplying a flowable pressure medium to said chamber thereby to deform said axial portion radially inwardly into pressure engagement with the shaft in the sleeve means.

3,917,423

PIPE CLAMP FOR RESISTING ROTATIONAL FORCES

Gary J. Ehlenbeck, 4782 N. Woodruff Ave., Whitefish Bay, Wis. 53217

Filed July 25, 1974, Ser. No. 491,732
Int. Cl.[2] F16D *1/00, 3/00*; **E21B** *19/16*
U.S. Cl. 403—204 **4 Claims**



1. A device affixable to the exterior surface of a pipe comprising:

a tubular collar suitable for internally receiving the pipe in close proximity thereto, said collar having a medial elongated slot aligned with the axis of said collar;

a clamping member having an arcuate projection adapted to extend through said slot, said projection having a convex surface for engaging said pipe;

radially extending bolts mounted on said collar adjacent either end of said slot;

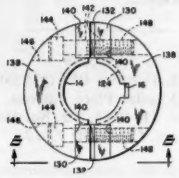
means on said clamping member coupling said arcuate projection to said bolts; and

nuts radially movable along said bolts into engagement with said coupling means to move said convex surface into engagement with the pipe.

3,917,424
CLAMPING DEVICE FOR COUPLINGS

Martin J. Zugel, Cleveland, Ohio, assignor to Cyclo Index Corporation, Cleveland, Ohio

Division of Ser. No. 379,384, July 16, 1973, Pat. No. 3,844,137. This application Apr. 10, 1974, Ser. No. 459,471
Int. Cl.² F16D *1/06*
U.S. Cl. 403—287 **10 Claims**

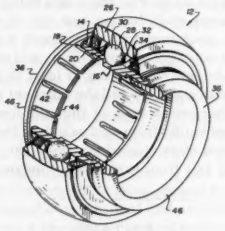


1. A clamping device for clamping at least one end of a coupling to a shaft comprising; a pair of opposite clamping members having cooperating arcuate facing inner surfaces, securing means for securing said clamping members to said one end of said coupling against axial and rotational movement relative thereto, and clamping means for drawing said clamping members toward one another to clamp said inner surfaces thereof to a shaft, said one end of said coupling including opposite projections extending longitudinally outwardly therefrom, said clamping members being positioned with their ends on opposite sides of said projections.

3,917,425
SHAFT LOCK DEVICE

Charles M. Allaben, Jr., Ithaca, N.Y., assignor to Borg-Warner Corporation, Chicago, Ill.

Division of Ser. No. 331,137, Feb. 9, 1973, Pat. No. 3,825,312. This application Dec. 20, 1973, Ser. No. 426,857
Int. Cl.² B63Q *3/157*
U.S. Cl. 403—371 **4 Claims**

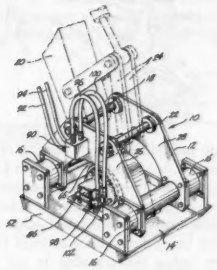


1. A shaft locking arrangement comprising:
- a cylindrical member having a first load bearing portion with an inside diameter to receive the shaft;
- at least one axial portion extending from said first portion and having an interior truncated conical surface spaced axially from said load bearing portion which conical surface converges with respect to said load bearing portion;
- a sleeve member received in said axial portion and having an inner diameter to receive said shaft;
- said sleeve member having an exterior truncated conical surface complementary to the conical surface of said axial portion;
- said sleeve member being movable axially with respect to said axial portion and toward said load bearing portion to wedge with said axial portion to lock said cylindrical member into engagement with said shaft for concurrent rotation therewith;
- means defining a groove in said axial portion intersecting said conical surface thereof; and
- an outwardly turned edge on said sleeve received in said groove when said sleeve is axially moved into locking position.

3,917,426
VIBRATORY COMPACTOR

Donald M. Wohlwend, Issaquah, and Maurice Wohlwend, Seattle, both of Wash., assignors to HED Corporation, Issaquah, Wash.

Filed June 5, 1974, Ser. No. 476,603
Int. Cl.² E01C *19/34*
U.S. Cl. 404—133 **4 Claims**



1. In a vibratory compactor of a type including a mounting frame connectible to a loading boom which applies a downward force on the frame during use, a compaction plate, a vibratory unit centrally located on said compaction plate, said unit including a rotating eccentric weight and a coaxial hydraulic drive motor, and spring means connecting said compaction plate to said mounting frame, the improvement comprising:
- said mounting frame comprising a pair of substantially identical, inverted U-shaped side plate members, and a pair of tubular cross members extending between opposed arm portions of said side plate members, said tubular cross members being rigidly connected at their ends to the arm portions of said plate members and being large enough in diameter to substantially stiffen said arm portions and maintain them substantially planar, and means for connecting said frame to a loading boom;
- said compaction plate including four corner located mounting portions spaced outwardly from the stiffened arm portions of the side plate members;
- said spring means comprising four elastomeric shear blocks disposed between the corner located mounting portions of said compaction plate and the stiffened arm portions of the side plate members, in line with said tubular cross members, said shear blocks being attached at their ends to the stiffened arm portions of said mounting frame, slightly radially outwardly of the location of connection of the tubular cross members to the stiffened arm portions, and to the corner located mounting portions of said compaction plate, but between their ends being free to distort in response to movement of the compaction plate relative to the mounting frame; and
- said arm portions of said side plate members extending below said shear blocks and terminating in free ends which are normally spaced from the compaction plate but are close enough to the compaction plate that they contact it and limit the amount of displacement of the compaction plate relative to the mounting frame to an amount below the limits of distortion of the shear blocks.

3,917,427
DRILL GUIDES

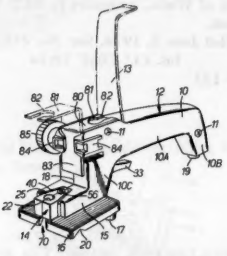
Ronald Price Hickman, Waltham Abbey, England, assignor to Inventec International Limited, St. Peterport, Guernsey (Channel Is.)

Filed Aug. 19, 1974, Ser. No. 498,530

Claims priority, application United Kingdom, Aug. 20, 1973, 39317/73; Apr. 8, 1974, 15519/74

Int. Cl.² B23B *49/00*

U.S. Cl. 408—72 **18 Claims**



1. A drill guide including a body having at least one abutment surface thereon, said body including a handle for manually maintaining the abutment surface against a workpiece, locating means retained on said body for selectively receiving one of several differently dimensioned guide sleeves, each of said guide sleeves being formed of at least two sleeve parts, said sleeve parts being positionable in an abutting closed position and in an at least partially separated open position, said sleeve parts having longitudinally extending opposed guide surfaces which, in said closed position, define a longitudinal passage for guiding a drill bit of predetermined shank diameter into the workpiece, said sleeve parts being movable to the open condition while being retained on the body to permit positioning of the passage around the drill bit by movement generally at right angles to the axis of the drill bit, and manually operable actuating means for moving said sleeve parts between said open and closed positions.

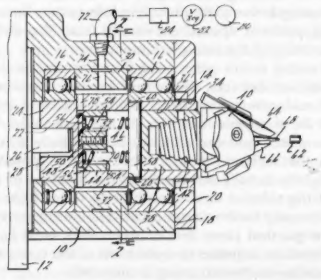
3,917,428
TUBE DEBURRING TOOL

Clifford D. Clark, Mount Clemens, Mich., assignor to Bundy Corporation, Detroit, Mich.

Filed Apr. 1, 1974, Ser. No. 456,680

Int. Cl.² B23B *47/22*

U.S. Cl. 408—130 **8 Claims**



1. A tube deburring tool including a housing mounted on a fixed support, a drive member journalled for rotation in said housing and held by said housing against axial movement, said fixed support including drive means for rotating said drive member, said housing being mounted on said fixed support forwardly of said drive means, a holder rotationally coupled to said drive member and axially slidable relative thereto, said holder having a cutter supporting portion at one end thereof and a piston portion, means in said housing defining a bore in which said piston portion is slidable and means independent of said drive member for admitting a timed pulse of fluid pressure into said housing to react against said piston portion and thereby axially move said holder relative to said drive member to advance a cutter carried by said holder into engagement with a workpiece.

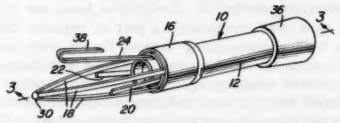
3,917,429
THIN WALL TUBING DEBURRING TOOL

Holmes E. Ertley, 33 Indian Place, Altoona, Pa. 16602

Filed Apr. 11, 1974, Ser. No. 460,163

Int. Cl.² B23D *77/12*

U.S. Cl. 408—227 **7 Claims**



1. A thin wall tubing deburring tool including support means, at least three elongated slightly bowed and stiff but resilient stays having one set of corresponding ends stationarily anchored to said support means at points spaced generally equally outwardly from and circumferentially about a center axis along which said stays extend, the other set of ends of said stays projecting endwise outwardly from said support and being rigidly anchored together at a point disposed on said axis, said stays being bowed slightly convexly away from the center axis, said stays being free intermediate their remote ends for independent flexing, said tool including at least three additional elongated stays spaced outwardly of and extending along said axis, said additional stays also being stiff but resilient, said additional stays having one set of corresponding ends stationarily anchored to said support means at points spaced generally equally outwardly from and about said center axis, said additional stays being at least slightly divergent away from the center axis toward the other set of corresponding ends, the other set of ends of the additional stays being spaced further outwardly from said axis than those portions of the first mentioned stays spaced generally the same distance along said center axis from said support means.

3,917,430
FLUID PRESSURE OPERATED ACTUATOR ARRANGEMENT

Joseph Louis Bloom, Droitwich, and Trevor Stanley Smith, Sutton Coldfield, both of England, assignors to Lucas Aerospace Limited, Birmingham, England

Filed July 3, 1974, Ser. No. 485,330

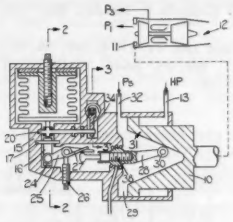
Claims priority, application United Kingdom, July 5, 1973, 32090/73

Int. Cl.² F02C *9/14, 7/02*

U.S. Cl. 415—26 **16 Claims**

1. A fluid pressure operated actuator arrangement, comprising a body, an actuator element movable with respect to said body in response to a servo pressure signal, first and second levers pivotally mounted in said body, transmission means engaged between said levers, means, responsive to a first input pressure signal, for urging said first lever into engagement with said transmission means, means for urging said second lever into engagement with said transmission means, a valve responsive to the position of one of said levers to provide said servo pressure signal, and a third lever mounted in said

body and engageable with said transmission means, said third lever being movable by said actuator element to vary the



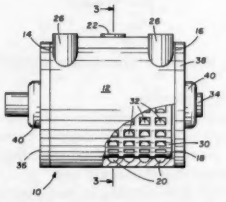
position of said transmission means with respect to the pivotal axis of one of said first and second levers.

3,917,431

MULTI-STAGE REGENERATIVE FLUID PUMP

Willis Earl Rose, Connersville, Ind., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Sept. 18, 1973, Ser. No. 398,496
Int. Cl.[2] F04D *5/00, 1/04*
U.S. Cl. 415—53 T **2 Claims**



1. A regenerative fluid pump comprising:

a generally cylindrical rotor having a plurality of pockets encircling the outer periphery thereof, said pockets being disposed in a plurality of spaced rows arranged generally parallel to the ends of said rotor, each said pocket defines a leading wall surface on said rotor that is disposed at an acute angle relative to the center-line of said rotor;

a housing having first and second ends, a generally cylindrical bore extending therethrough intersecting said first and second ends and sized to closely receive said rotor, a first port extending through said housing into said bore, a pair of second ports extending through said housing into said bore and located closer to said first and second ends than said first port, a plurality of spaced grooves in said housing and partially encircling said bore and arranged generally parallel to said first and second ends, each said row being in radial alignment with a respective row of pockets in said rotor, and means for connecting said grooves to provide communication between said first port and each said second port; and, end closure means for closing each end of said bore and rotatably supporting said rotor, whereby rotation of said rotor causes fluid to flow through said pump via said ports and grooves.

3,917,432

BORESCOPE SUPPORT APPARATUS

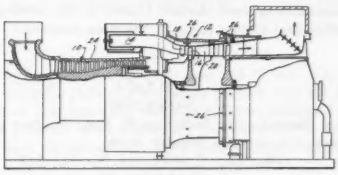
Roger F. Feuerstein, Schenectady; Maurice A. Freeman, Burnt Hills, and Leonardo B. Spinelli, Albany, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 13, 1974, Ser. No. 523,431
Int. Cl.[2] F01D *25/29*
U.S. Cl. 415—118 **3 Claims**

1. A gas turbine engine including a compressor, a turbine and a casing structure extending around said compressor and turbine, an access port formed through said casing structure, a borescope probe having an elongated stem portion projecting through said access port, and means for supporting said borescope probe, said means comprising:

a housing having a central opening sized to receive said borescope stem portion said housing adapted to be secured to said gas turbine casing with said central opening in general axial alignment with said casing access port;

a pair of spherical bearings, each said bearing having a first portion and a second portion, each said first portion formed with a concave surface and each said second portion formed with a convex surface adapted to seat on the concave surface of its respective first portion, a central opening formed through said spherical bearings and sized to receive said borescope stem portion, said bearings disposed in said housing with said concave surfaces facing each other and said bearing central openings in general axial alignment with said housing central opening; at least one resilient deformable washer disposed between



said spherical bearings and formed with an annular opening therethrough which is generally axially aligned with said bearing central openings and is sized, in a nondeformed condition, to slideably receive said borescope stem portion in close fitting relationship therewith;

a locking collar threadably engaged in said housing and formed with a central opening therethrough which is sized to receive said borescope stem portion and is generally axially aligned with said housing central opening;

the outer portion of one said bearing secured to said housing and the outer portion of the other said bearing secured to said locking collar, whereby when said locking collar is in a loose position, said borescope stem portion may be freely moved along and rotated about its axis and swivelled about a point intermediate said bearings and means when said locking collar is rotated in a direction of deeper threaded engagement with said housing, said resilient washer is deformed by said bearings into gripping engagement with said borescope stem portion and said bearings become frictionally locked.

3,917,433

DEVICE FOR OPENING AND CLOSING SHUTTER OF VENTILATING FAN

Tokuhiro Tomitaka, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Filed Feb. 12, 1974, Ser. No. 441,822
Claims priority, application Japan, Feb. 12, 1973, 48-16620
Int. Cl.[2] F04D *29/56, 25/14*
U.S. Cl. 415—148 **7 Claims**

1. In a device for opening and closing the shutter of a ventilating fan, the improvement comprising

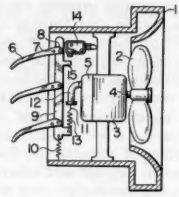
a shutter mechanism including shutter blades having respective opening and closing positions,

first means for applying a force to said shutter mechanism to urge said shutter blades to the opening position,

motor means for rotating said ventilating fan,

second means coupled to said motor means for selectively moving said shutter blades into said opening and closing positions, said second means utilizing the rotational force of said motor means to overcome said force of said first means such that said shutter blades are moved into said closing position, and said second means releasing the

effect of said rotational force such that said shutter blades are moved into said opening position, and

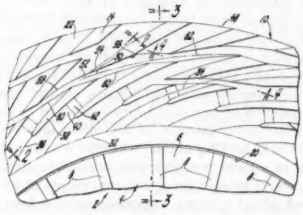


third means coupled to said second means for preventing said rotational force from exceeding the closure force for maintaining said shutter blades in the closing position after said closing position has been achieved.

3,917,434
DIFFUSER

Phiroze Bandukwalla, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 7, 1974, Ser. No. 512,548
Int. Cl.² F04D *29/44*
U.S. Cl. 415—181 **2 Claims**

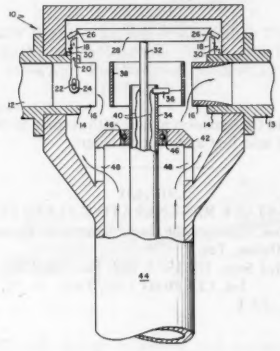


1. A centrifugal compressor comprising a rotor discharging radially and tangentially of the axis of the rotor and a diffuser body having a first set of diffuser passages with entrances adjacent the periphery of the rotor, said first plurality of diffuser passages each having arcuate cross sections and merging adjacent the rotor so that the body defines approximately elliptical leading edges at the intersections of the passage boundaries, each diffuser passage including a first converging portion with a spiral center line terminating at a throat region and a second diverging portion beginning at and extending in a continuous spiral downstream from the throat region, a divider rib located between each of said first plurality of diffuser passages, each of said ribs including a pressure surface thereon and a suction surface thereon, a bleed passage directed through each of said ribs having an inlet intersecting one of said diffuser passages at a pressure surface and an outlet intersecting an adjacent one of said first plurality of diffuser passages at a suction surface, each of said inlets being located downstream of one of said throat regions and operative to direct subsonic flow downstream of one of said throat regions from a pressure surface through one of said bleed passages to a suction surface for improving boundary flow at the suction surface and to increase the diffuser exit area between the entrance of each of said first plurality of diffuser passages and the exterior periphery of said diffuser body.

3,917,435
CAM AND NOZZLE CONTROL VALVE FOR FLUID FLOW MODULATION

Joseph B. Wilkerson, 24604 Marlboro Drive, Damascus, Md. 20750, and Kenneth R. Reader, Box 73A, Monrovia, Md. 21770

Filed Jan. 11, 1974, Ser. No. 432,726
Int. Cl.² B64C *15/08, 27/18*
U.S. Cl. 416—20 **10 Claims**

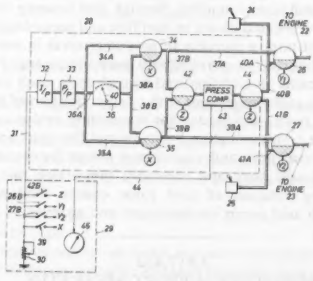


1. A rotor hub for a circulation control helicopter rotor comprising:
a non-rotating member;
means to horizontally translate said non-rotating member;
a rotating blade-carrying member surrounding said non-rotating member and spaced therefrom to form a fluid flow passage therebetween; and
movable fluid flow nozzles in said rotating blade-carrying member adjacent the nonrotating member.

3,917,436
DUAL PUMP CONTROL SYSTEMS

Ethell J. Dower, Houston, Tex., assignor to Drill-Au-Mation, Inc., Houston, Tex.

Filed Oct. 4, 1973, Ser. No. 403,344
Int. Cl.² F04B *49/00, 49/02*
U.S. Cl. 417—5 **16 Claims**



1. A control system for regulating the control of at least two motive control means relative to one another comprising:
first motive control means including
an electrically controllable source for producing first fluid control pressure, a manually variable source for producing a second fluid control pressure, first pressure output means, first pressure selection means coupled to said first

and second fluid control pressures for selectively supplying one of said first and second fluid control pressures to said first pressure output means,

second motive control means including

pressure modifier means responsive to an input pressure for producing a third fluid control pressure at a modified pressure relative to said input pressure, and another manually variable source for providing a fourth fluid control pressure, said modifier means being coupled to said electrically controllable source, second pressure output means,

second pressure selection means coupled to said third and fourth control pressures for selectively supplying one of said third and fourth fluid control pressures to said second output means,

means for also supplying said first fluid control pressure to said pressure modifier means as said input pressure, and means for comparing one of said selected ones of said fluid control pressures with one of said non-selected fluid control pressures.

3,917,437

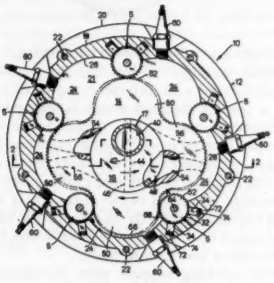
SEAL FOR A ROTARY PISTON DEVICE

Edwin A. Link, 317 S. Greenfield Ave., Waukesha, Wis. 53186

Filed Mar. 18, 1974, Ser. No. 452,214

Int. Cl. F04c *27/00*; **F01c** *19/00*

U.S. Cl. 415—125 **8 Claims**



1. A rotary piston device comprising a housing having a number of chambers,

a rotor having a number of lobes equal to one less than the number of chambers and a shaft journalled for rotation on the axis of the housing,

a series of gear teeth on the surface of each of said lobes, a hub eccentrically mounted on the shaft, said rotor being mounted for rotation on said hub in the opposite direction of rotation of said shaft to volumetrically displace fluid in said chambers,

rotary seal members mounted in said housing between said chambers in a position to engage the surface of the lobes on said rotor,

and a series of gear teeth on the surface of said rotary seal members for sealingly engaging said gear teeth on said lobes.

3,917,438

ROTARY COMPRESSOR OF THE SLIDING VANE TYPE

Rune Glanvall, Norrkoping, Sweden, assignor to Stal Refrigeration AB, Norrkoping, Sweden

Filed Aug. 9, 1973, Ser. No. 386,953

Claims priority, application Sweden, Aug. 24, 1972, 10959/72

Int. Cl.² F04C *1/00*

U.S. Cl. 418—150 **2 Claims**

1. A rotary compressor of the sliding vane type comprising:

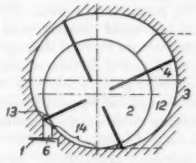
a. a stator;

b. a cylindrical rotor housed within said stator and defining therebetween a low pressure portion having an inlet for the working fluid and a high pressure portion having an outlet for the working fluid;

c. a plurality of vanes extending from the exterior surface of said rotor in resilient slidable engagement with the inner surface of said stator;

d. the cross sectional profile of said stator defining three separate, substantially circular arcs;

e. one of said arcs having the same radius as said rotor and forming a transition zone providing a sliding seal between the stator and the rotor in said zone;



f. a second arc extending from one end of said transition zone having a radius of curvature greater than the mean radius of the stator and defining together with said rotor a low pressure zone increasing progressively in volume from said transition zone to a predetermined optimum; and

g. a third arc extending from said second arc having a radius of curvature smaller than the mean radius of the stator defining together with the rotor a high pressure zone decreasing progressively in volume to merge with the other end of said transition zone.

3,917,439

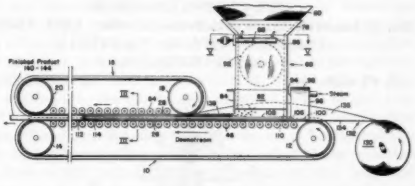
APPARATUS FOR PRODUCING STOCK OF SYNTHETIC THERMOPLASTIC MATERIAL BY CONTINUOUS MOLDING

Joseph T. Yovanovich, 1415 Orchard Way, Rosemont, Pa. 19010

Filed Mar. 28, 1974, Ser. No. 455,617

Int. Cl.² B29D *27/04*

U.S. Cl. 425—4 C **3 Claims**



1. In apparatus for continuously molding stock consisting of a foamed, coherent agglutinated core of polymeric material tightly enclosed in a sheet of polymeric material, the combination comprising

A. lower and upper endless belts each trained about a head and a tail pulley, the head pulley about which the lower belt is trained being disposed upstream from the head pulley about which the upper belt is trained, and each having a depressed outwardly facing surface area intermediate the opposite side marginal areas thereof, the upper run of the lower belt and the lower run of the upper belt being disposed in mutually overlying relation for movement together away from said head pulleys in the downstream direction at the same rate of speed, and being disposed with the depressed surface areas thereof registering and thereby conjointly defining a continuous

open ended mold channel having closed longitudinally extending opposite sidewalls, said mold channel being wide and comparatively shallow in transverse section for production of stock in the form of a flat board,

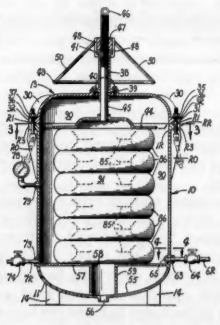
B. rollers underlying, overlying and on each side of said mutually overlying runs of the belts, said rollers being operative for supporting and guiding the same and assuring registration thereof as aforesaid,

C. a hopper for continuously feeding unexpanded granules of the polymeric material which is to form the core of said stock into said sheet of polymeric material preliminary to folding the same and thereby forming thereof a sleeve enclosing said granules and preliminary to feeding said sleeve and the granules contained thereby into the upstream end of said mold channel, said hopper having an opening in the bottom thereof through which said material is discharged into a section of the upper run of the lower belt extending between said head pulleys, and having laterally spaced opposed sidewalls with lower sections diverging downwardly and outwardly for having the opposite side marginal areas of said sheet material raised and disposed respectively in overlying relation thereto,

D. a steam manifold mounted on the upstream side of said hopper, said manifold being provided with laterally spaced opposed sidewalls respectively coplanar with the laterally spaced opposed sidewall areas of the hopper, and being provided with a bottom wall disposed in close spaced overlying relation to the depressed outwardly facing surface of the underlying belt, and

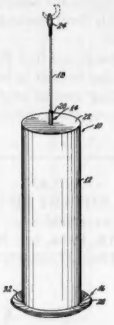
E. a plurality of laterally spaced tubular members extending from said steam manifold into the upstream end of said mold channel and downstream deep into the same and disposed with their central axes in a plane coincident with the interface between the upper run of the lower belt and the lower run of the upper belt, said tubular members being tapered gradually from a large diameter at the upstream end thereof to a smaller diameter at the downstream end thereof, being coated on the outside with polytetra-fluoroethylene, being closed at the downstream end thereof, and being perforated for discharge of steam therefrom into the mold channel directly into the granules of polymeric material contained by said sleeve of sheet material.

3,917,440
TIRE CURING CHAMBER
Ben R. Huebert, 233 W. Ponderosa, Reedley, Calif. 93654
Filed Feb. 7, 1975, Ser. No. 547,816
Int. Cl.[2] B29H *5/04*
U.S. Cl. 425—18 **7 Claims**



1. A tire curing chamber comprising a tank adapted to receive a plurality of tires therein in stacked relation: means for axially compressing the tires into substantially airtight engagement so as to form substantially isolated compartments in the tank, one thereof interiorly of the stacked tires and another exteriorly thereof; means for supplying steam under pressure to the exterior compartment; and means opening the interior compartment to the atmosphere.

3,917,441
HANGING CANDLE STRUCTURE
Roy M. Gray, 2102 N. 26th Place, Phoenix, Ariz. 85008
Filed May 23, 1974, Ser. No. 472,606
Int. Cl.[2] F23D *3/16*
U.S. Cl. 431—292 **4 Claims**



1. A hanging candle structure comprising:

a. a candle body;

b. a wick formed with an outer covering of wicking material and a core of material which is impervious to the heat produced by combustion of said candle body, said wick centrally located in said candle body and having the core thereof extending upwardly from the outer covering of wicking material so that said candle body is suspendingly mountable by means of the core of said wick;

c. a tail depending from the bottom of said candle body, said tail formed by the core of said wick which extends downwardly from said candle body;

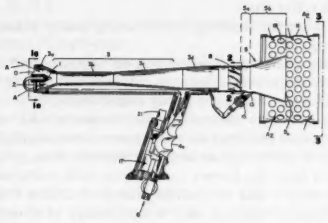
d. a drip catching support plate in engagement with the bottom of said candle body, said support plate extending laterally circumferentially beyond the periphery of said candle body for catching candle drippings produced by combustion of said candle body; and

e. means on said drip catching support plate for gripping said tail for affixing said support plate to said candle body.

3,917,442
HEAT GUN
Dimiter S. Zagoroff, 4 Brigham ST., East Boston, Mass. 02128
Continuation-in-part of Ser. No. 197,207, Nov. 10, 1971, Pat. No. 3,779,694. This application Apr. 16, 1973, Ser. No. 351,359
The portion of the term of this patent subsequent to Dec. 18, 1990, has been disclaimed.
Int. Cl.[2] F23D *15/00*
U.S. Cl. 431—351 **37 Claims**

1. A hand held aimable shrink gun plastic film capable of providing a shrink-producing flow of heated air in the 250°F to 1000°F range against plastic film lying over an object to be covered, the shrink gun relying upon fuel along without assistance of blowers or compressors, said shrink gun comprising a gas jet adapted for connection to a conventional fuel gas source such as propane having a stoichiometric burning temperature substantially exceeding 3000°F, a jet pump activated by said gas jet and having an opening for drawing atmospheric air for combustion into a subatmospheric pressure region produced by said jet, said jet pump constructed to impart velocity to said combustion air by mixing, an enlarged pres-

sure recovery passage into which the mixture of gaseous fuel and combustion air proceeds, said recovery passage constructed to convert velocity head of said gases to a pressure head exceeding atmospheric pressure, an internal combustion chamber having an entry into which said pressure recovery passage discharges, said internal combustion chamber having a flame holding means at said entry and an outlet discharging into an ambient air propelling and mixing zone preceding said work object, the respective parts of said shrink gun con-



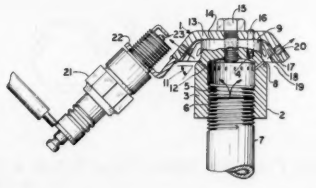
structed to introduce and burn said fuel in substantially stoichiometric conditions and discharge combustion gases into said propelling zone at a temperature exceeding 3000°F and a velocity in excess of 4000 feet per minute in a manner to propel relatively larger quantities of ambient air in the same direction with attendant heating thereof by said combustion gases, thereby to produce a flow against said plastic film at temperature in the 250°F to 1000°F range, consisting in major part of ambient air propelled and heated by said combustion gases.

3,917,443

GASEOUS FUEL BURNER

Vernon Adams, 2213 W. 48th St. Terrace, Shawnee Mission, Kans. 66205

Filed Oct. 7, 1974, Ser. No. 512,739
Int. Cl.² F23D *13/40*
U.S. Cl. 431—354 **6 Claims**



1. A butane gaseous fuel burner adapted to produce a relatively constant air-fuel mixture under wide fuel pressure variations comprising:

a. a fuel receiving housing having a side wall and a closed dome forming a fuel chamber, said dome including an upwardly and inwardly tapering ring section formed about an axis and a central mounting boss, said ring section having an external frusto-conical ring surface,

b. a plurality of circumferentially spaced-apart fuel discharge bores extending through said ring section and communicating with said fuel chamber,

c. a cap mounted on said boss and projecting radially and downwardly over said ring surface, said cap having a lower surface extending in generally parallel relation to said ring surface and being spaced therefrom, said ring surface and cap lower surface defining a circular mixing area therebetween and a mouth immediately open to ambient and communicating into said mixing area, and

d. a bore in said cap for each of said fuel discharge bores and aligned axially therewith, said cap bores being approximately ten times the diameter of said discharge bores and said spacing between said cap lower surface and said ring surface being approximately twice the diameter of said cap bores, said cap bores extending through said cap at an angle to said ring section axis of greater than approximately 120°,

e. said cap bores being positioned with respect to said side wall whereby air moving upwardly along said side wall turns less than 90° for discharge through said cap bores, and

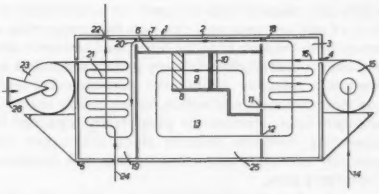
f. whereby fuel directed through said discharge bores travels upwardly and outwardly across said mixing area and out said cap bores.

3,917,444

HEAT RECOVERY SYSTEMS

Maximilian Kurt Carthew, Maidstone, England, assignor to Carrier Drysys Ltd., Warwick Row London, England

Continuation-in-part of Ser. No. 142,469, May 12, 1971, abandoned. This application Oct. 2, 1973, Ser. No. 402,849
Claims priority, application United Kingdom, May 15, 1970, 23796/70
Int. Cl.² F26B *5/00;* **B01J** *6/00;* **F23J** *17/00*
U.S. Cl. 432—72 **9 Claims**



1. A heat recovery system for an industrial process which process produces a combustible gaseous effluent as a by-product and said process having at least two inlets for heated gas supplied by the heat recovery system and an exhaust duct for said effluent, said heat recovery system comprising a combustion chamber, a direct ignition device located in the combustion chamber, an inlet duct connected to said exhaust duct and leading into the combustion chamber, a fan in said inlet duct for causing the effluent to flow through the combustion chamber and over the direct ignition device, a further exhaust duct for the burnt effluent and leading out of the combustion chamber, a first heat exchanger in communication with said exhaust duct, said heat exchanger having a fresh air inlet and at least part of the burnt effluent being passed in heat exchange relationship with air passing through said fresh air inlet, at least two supply ducts in communication with the first heat exchanger and connected respectively to said two inlets in the process for supplying heated gas from said heat exchanger respectively to said two inlets in the industrial process, temperature control means located across each supply duct for individually controlling the temperature of the heated gas in the respective supply ducts and for maintaining a constant weight of heated gas flowing through each supply duct into the process, and a preheater for the unburnt effluent in the form of an indirect, second heat exchanger located in the further exhaust duct from said combustion chamber, the unburnt effluent passing to the inlet duct of the combustion chamber from the industrial process via said second heat exchanger where it is heated by the burnt effluent passing through said further exhaust duct.

3,917,445

BAKING OVEN FOR BREAD

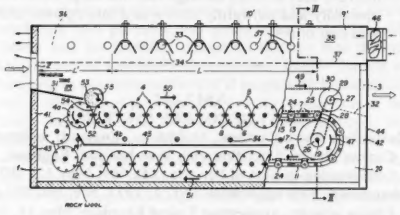
Tito R. Suvā, and Hans-Peter Schmidt, both of Geneva, Switzerland, assignors to Grands Moulins De Paris, Paris, France

Filed May 24, 1974, Ser. No. 472,990

Claims priority, application Switzerland, May 25, 1973, 7524/73

Int. Cl.[2] F27B 9/16

U.S. Cl. 432—124 13 Claims



1. An oven for finishing and crusting partly baked bread, comprising:

a baking chamber having a pair of opposite end walls respectively provided with an entrance slot and an exit slot for elongate loaves of partly baked bread;

endless conveyor means disposed between said end walls within said chamber with an upper run substantially at the level of said entrance and exit slots for transporting said loaves from the former to the latter, said conveyor means including a multiplicity of closely juxtaposed rollers independently rotatable about axes perpendicular to the transport direction, said rollers having axially spaced end members interconnected by peripherally separated loaf-supporting members defining along said upper run a generally horizontal supporting surface with downwardly converging gaps;

drive means for moving said conveyor with codirectional rotation of said rollers at least along said upper run whereby loaves cradled in said gaps are continuously turned about their own axes on passing from said entrance slot to said exit slot; and

heat-radiating means in said chamber above said upper run.

2. An oven as defined in claim 1 wherein said conveyor means comprises a pair of parallel endless transport chains fitted with equispaced bearings, said rollers being provided with shafts having extremities journaled in said bearings, said drive means including a toothed wheel on each roller shaft and a rack extending along said upper run for periodic engagement with the toothed wheel of each roller shaft.

8. An oven for finishing and crusting partly baked bread, comprising:

a baking chamber having a pair of opposite end walls respectively provided with an entrance slot and an exit slot for elongate loaves of partly baked bread;

endless conveyor means disposed between said end walls within said chamber with an upper run substantially at the level of said entrance and exit slots for transporting said loaves from the former to the latter, said conveyor means including a pair of endless transport chains fitted with equispaced bearings and a multiplicity of closely juxtaposed rollers with shafts having extremities journaled in said bearings for independent rotation about axes perpendicular to the transport direction, said rollers defining along said upper run a generally horizontal supporting surface with downwardly converging gaps;

a toothed wheel on each roller shaft;

an ancillary endless chain with a substantially horizontal reach forming a rack extending along said upper run for periodic engagement with the toothed wheel of each roller shaft;

drive means for moving said conveyor with codirectional rotation of said rollers at least along said upper run whereby loaves cradled in said gaps are continuously turned about their own axes on passing from said entrance slot to said exit slot, said drive means including a transmission linking said ancillary and transport chains for displacement of said reach against said transport direction; and

heat-radiating means in said chamber above said upper run.

3,917,446
SINGLE BATH FUNGICIDAL CHROME-ZIRCONYL ACETATE MINERAL DYEING PROCESS FOR CELLULOSICS

Charles J. Conner, Metairie, La., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Mar. 22, 1974, Ser. No. 453,910
Int. Cl.[2] C09B *63/00;* **D06P** *3/64*
U.S. Cl. 8—52 **6 Claims**

6. A single bath chrome mineral dyeing process for cellulosics (fabrics) comprising:

a. Wetting a cellulosic material in an aqueous solution containing about 1 to 2.5 weight percent chromium (as chromium hydroxydiacetate), 16 to 25 weight percent zirconyl acetate, and the difference (about 72.5 to 83 weight percent) — water to make 100 weight percent,

b. drying and subsequently curing the wetted fabric from (a), and

c. wetting the dyed cellulosic from (b) with a paraffin-ammonium stearate water-wax emulsion, containing 7% paraffin (weight percent), and

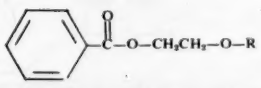
d. drying and subsequently curing the wetted fabric from (c).

3,917,447
DYE COMPOSITIONS

Remus I. Lazar, Berwyn, and Richard C. Reichel, Chicago, both of Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Filed May 14, 1974, Ser. No. 469,159
Int. Cl.[2] D06P *3/54*
U.S. Cl. 8—92 **5 Claims**

1. A dye composition comprising one part by weight of a disperse dye and from one to twenty parts by weight of a dye assist consisting of a mixture of butyl benzoate and a compound of the formula



wherein R is alkyl of up to 4 carbon atoms, in a weight ratio of from 4:1 to 1:4.

3,917,448
RANDOM FIBER WEBS AND METHOD OF MAKING SAME

Dennis E. Wood, Rochester, N.Y., assignor to Rondo Machine Corporation, Mocedon, N.Y.

Continuation of Ser. No. 841,215, July 14, 1969, abandoned. This application Jan. 4, 1973, Ser. No. 320,924
Int. Cl. D06m *1/02*
U.S. Cl. 8—125 **6 Claims**

1. A process of making a non-woven fabric having a high degree of loft, which comprises

aerodynamically depositing different types of fibers, some retractable and others non-retractable under the conditions of the process, simultaneously in an area where said fibers intermingle to form a web having a random pattern of fiber arrangement throughout the entire length, breadth and depth of said web,

systematically controlling the deposition of said fibers in said area to

vary the predominance of one type of fiber over others of said different types of fibers in zones arranged depthwise of and essentially parallel with the major surfaces of said web, a zone delimited by a major face of said web being composed of predominantly different fibers than those of a zone immediately adjacent thereto, and to

position said fibers so that some extend from one zone into another and some through all of the plurality of zones lying between the major surfaces of said web and, thereafter,

subjecting said zoned web to a retracting operation to effect shrinkage of said retractable fibers and cause said retractable fibers to loop, buckle and curl and, thereby, lock adjacent fibers together at their points of contact and tie said web structure together from within without significantly elimiating interfiber voids.

3. The method of making a monwoven fabric according to claim **1**, wherein the retractable fibers are natural cellulosic fibers and retraction is effected by treating the web with a sodium hydroxide solution of mercerizing strength.

6. A non-woven fiber web produced by the process of claim **1**.

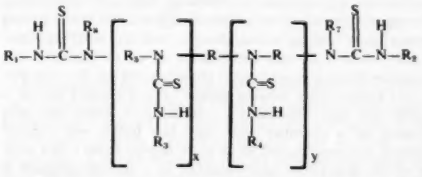
3,917,449
POLYTHIOUREAS TO INHIBIT OZONE FADING OF DYED POLYAMIDES

Rodney Lee Wells, Chester; Robert Alden Lofquist, Richmond, and Stanley David Lazarus, Petersburg, all of Va., assignors to Allied Chemical Corporation, Petersburg, Va.

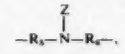
Filed Feb. 11, 1974, Ser. No. 441,595
Int. Cl.[2] D06P *5/02*
U.S. Cl. 8—165 **10 Claims**

1. A method for improving fastness of dyes when exposed to ozone in polycarbonamide fibers dyed with anthraquinone dyes consisting of

coating said fibers with a substance consisting essentially of a compound having a formula



where *x* and *y* are 0, 1 or 2, R is a difunctional aliphatic hydrocarbon radical or



where Z is H or

R_1, R_2, R_3, or R_4 are independently selected from phenyl or a monofunctional allyl or alkyl radical of 1 to 12 carbon atoms, R_5 and R_6 are $(CH_2)_2$, $(CH_2)_3$ or

R_7, R_8 are independently selected from H or monofunctional allyl or alkyl radical of 1 to 12 carbon atoms, provided that when $x = 0$ and R_1 and R_2 are allyl then R must be a difunctional fatty acid residue moiety of 24 to 108 carbon atoms or a difunctional alkyl substituted cyclic aliphatic hydrocarbon,

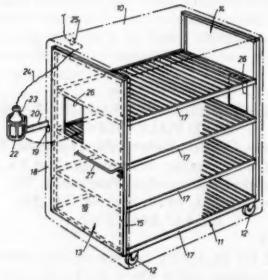
so that from about 0.5 to about 5 percent on weight of the fiber of the compound remains on said fiber after subsequent water treatment to substantially reduce rate of fading due to exposure to ozone of fabric of said dyed fiber.

3,917,450

APPARATUS FOR TEMPERATURE SIMULATION AND CONTROL IN A STEAM STERILIZER

Bertil Lennart Mårtensson, and Bengt Olof Johansson, both of Getinge, Sweden, assignors to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Apr. 1, 1974, Ser. No. 457,122
Claims priority, application Sweden, Apr. 3, 1973, 7304699
Int. Cl.[2] A61L *3/00, 3/02*
U.S. Cl. 21—94 **5 Claims**



1. In an apparatus for steam sterilization of solutions in closed receptacles having a chamber defined by walls and having an opening in one of said walls with a closure means therefor, the improvement comprising: means for controlling the temperature of said steam sterilization, a test bottle having a temperature sensing means therein, said test bottle containing the solution of said receptacles so as to simulate said recepticles when placed in said chamber, means for connecting said temperature sensing means to said control means, a support for said test bottle, said support being movably mounted on a chamber wall, said test bottle and support arranged and constructed so as to be moved from a first position in the interior of said chamber to a second position in which the test bottle and the support therefore are located outside of said chamber and adjacent to said opening in the chamber, whereby, in said first position, said test bottle simulates the conditions of said receptacles and provides said control means with an indication of the temperature of the solution in said receptacles via said sensing means, and, in said second position, said test bottle and the support therefor are so disposed as to ensure the unimpeded insertion into said chamber of said closed receptacles to be sterilized.

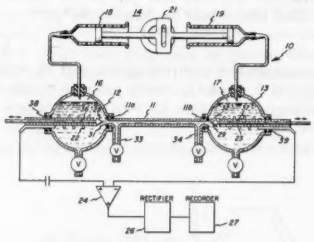
5. In an apparatus for steam sterilization of solutions in closed receptacles having a chamber defined by walls and having an opening in one of said walls with closure means therefor, the improvement comprising: means for controlling the temperature of said steam sterilization, a test bottle having a temperature sensing means therein, said test bottle containing the solution of said receptacles so as to simulate said receptacles when placed in said chamber, means for connecting said temperature sensing means to said control means, a support for said test bottle, an indentation in a chamber wall facing the interior of said chamber and forming a pocket in the inside of said chamber, a movable operator means for said test bottle and said support being operable from the exterior of said chamber whereby said support and test bottle can be selectively moved from a first postion in said pocket to a second position in the interior of said chamber, whereby, in said first position, said test bottle simulates the conditions of said receptacles and provides said control means with an indication of the temperature of the solution in said receptacles via said sensing means, and, in said second position, said test bottle and the support therefor are so disposed as to ensure the unimpeded insertion into said chamber of said closed receptacles to be sterilized.

3,917,451

ELECTROKINETIC STREAMING CURRENT DETECTION

James N. Groves, and Joel H. Kaplan, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed July 2, 1973, Ser. No. 375,714
Int. Cl.[2] G01N *33/16, 27/00*
U.S. Cl. 23—230 B **18 Claims**



1. Apparatus for use in electrokinetic streaming current detection comprising in combination:

a. a pair of electrolyte chambers having electricaly non-conducting wall structure,

b. means interconnecting said pair of chambers for providing flow communication therebetween through a flow restriction,

c. a first reversible electrode projecting into the first of said chambers and being adapted to be electrically connected externally of said first chamber,

d. second reversible electrode means projecting into the second of said chambers and being adapted to be electrically connected externally of said second chamber and

e. means in flow communication with said first and second chambers for simultaneously applying pressure in said first chamber and suction in said second chamber and then reversing and simultaneously applying pressure in said second chamber and suction in said first chamber, the reversal of the pressure/suction action being accomplished according to a fixed frequency

whereby when said chambers are partially filled with electrolyte, oscillating flow of electrolyte through the flow restriction is established and maintained, said electrodes being connected to an amplifier the output of which is connected to a rectifier/-recorder combination.

3,917,452
DIAGNOSTIC AGENT FOR THE DETECTION OF PEROXIDATIVELY ACTIVE SUBSTANCES

Walter Rittersdorf, Mannheim-Waldhof; Werner Güthlein, Mannheim-Neckarau; Hans-Georg Rey, and Peter Rieckmann, both of Mannheim-Waldhof, all of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Germany

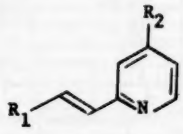
Filed Nov. 25, 1974, Ser. No. 526,661

Claims priority, application Germany, Dec. 20, 1973, 2363344

Int. Cl.² C07D *213/24*; **G01N** *31/22, 33/16*

U.S. Cl. 23—230 B **25 Claims**

1. Test strip composition for the detection of peroxidatively-active substances in body fluids, comprising a carrier containing a hydroperoxide, at least one chromogen and, as an activator, a compound of the formula:



wherein

R_1 is pyridyl or a phenyl optionally substituted by lower alkyl or alkoxy; and

R_2 is hydrogen or lower alkyl.

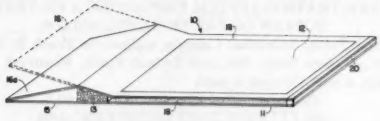
3,917,453
METHOD AND DEVICE FOR DETERMINING THE CONCENTRATION OF A SUBSTANCE IN A FLUID

Terry W. Milligan, Belmont, and Richard F. Wright, Acton, both of Mass., assignors to Polaroid corporation, Cambridge, Mass.

Filed Aug. 16, 1974, Ser. No. 498,021

Int. Cl.² G01N *31/14, 31/22, 33/16*

U.S. Cl. 23—230 B **10 Claims**



1. A method for determining the concentration of a substance in a fluid which comprises:

disposing said fluid onto absorbent fluid receiving means disposed intermediate a first and second sheet in superposed relationship;

subjecting said absorbent fluid receiving means to sufficient compressive force to discharge at least a portion of said fluid from said absorbent fluid receiving means into contact with reagents disposed intermediate said first and second sheets, said reagents adapted to react with said substance to provide a visual indication of the concentration of said substance.

3,917,454
EXHAUST EMISSION ANALYSIS METHOD

Gary E. Clark, Chicago, Ill., assignor to Sun Electric Corporation, Chicago, Ill.

Filed July 22, 1974, Ser. No. 490,673

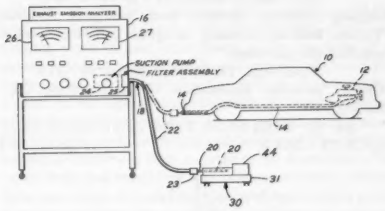
Int. Cl.² G01N *33/22, 1/22*

U.S. Cl. 23—232 R **5 Claims**

1. A method of analyzing the exhaust flowing through an exhaust pipe connected to an internal combustion engine by means of an analyzer capable of indicating the concentration of at least one component of the exhaust transmitted to the analyzer through a conduit comprising a probe adapted to fit into the exhaust pipe and a hose connected between the probe and the analyzer, said method comprising the steps of:

heating the air inside the probe;

transmitting the heated air through the hose into the analyzer, so that the entire length of the conduit is exposed to the heated air;



placing the probe adjacent the exhaust pipe; and

transmitting the exhaust from the tail pipe through the conduit into the analyzer, whereby the heating of the air inside the entire length of the conduit prevents the condensation of moisture in the conduit, thereby increasing the accuracy of the analyzer.

3,917,455
EQUIPMENT FOR THE AUTOMATIC DETERMINATION OF THE CHEMICAL COMPOSITION OF LIQUID BY SAMPLING AND BY ADDING OF REAGENTS

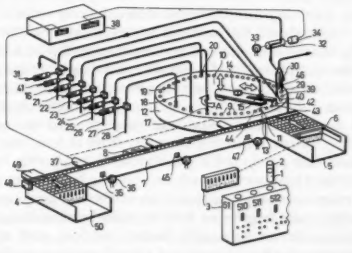
Béla Bak; Ferenc Engard, and József Szoke, all of Budapest, Hungary, assignors to MTA Központi Fizikai Kutató Intezet, Budapest, Hungary

Filed May 10, 1974, Ser. No. 468,882

Claims priority, application Hungary, May 18, 1973, MA 2475

Int. Cl.² G01N *33/16, 21/24, 1/14*

U.S. Cl. 23—253 R **6 Claims**



1. Equipment for the automatic determination of the chemical composition of liquids by sampling and by adding reagents, comprising a plurality of liquid sample cups arranged in sample magazines with a plurality of said cups in each of said magazines, a rotary table, means for rotating said table stepwise, plurality of processing containers arranged in a peripheral series about said table, means to forward said magazines tangentially of said table, means movable vertically and also radially of said table for transferring liquid from said cups to said containers, means to dispense reagents into said containers, means to effect a measurement of the chemical composition of the liquids in the containers, means to remove liquids from the containers and to rinse the containers with water and air dry the containers, said removing means comprising suction pipe, said determining means receiving liquid from said suction pipe, means for shining light through said cups on said

forwarding means that have moved beyond said table, and for reading the light that shines through said cup to identify the cup through which said light is shining, said light-shining means being so positioned relative to said forwarding means that the liquid in said determining means was drawn from the cup through which said light is shining.

3,917,456
ALCOHOL BREATH TESTING SET

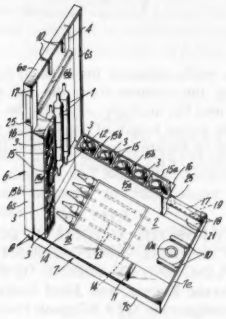
Wolfgang Eckstein, Sereetz, and Wolfgang Anklam, Alt-Techau, both of Germany, assignors to Dragerwerk Aktiengesellschaft, Germany

Filed Sept. 18, 1974, Ser. No. 507,215

Claims priority, application Germany, Nov. 13, 1973, 7340562

Int. Cl.[2] B65D *69/00, 71/00, 85/38;* **G01N** *33/16*

U.S. Cl. 23—254 R **5 Claims**



1. An alcohol breath testing set comprising a container having first and second half portions of rectangular pan-shape configuration, each having a bottom wall and outstanding side and end walls connected to said bottom wall, hinge means hinging said half portions together adjacent their one ends so that the opposite ends and side edges may be closed in juxtaposition, each of said containers having a plurality of mouthpiece receiving compartments defined along respective opposite edges of said half portions which project into the opposite half portion when the half portions are juxtaposed in a closed position, a plurality of pairs of spaced substantially parallel alcohol indicator tube clamping elements for securing alcohol indicator tubes therebetween located on the respective bottom walls of each of said half portions, and measuring bag holding means projecting inwardly from at least one end wall of said half portions for positioning a measuring bag in the associated half portion, and a measuring bag having an indicator tube receiving opening with a fitment neck around the opening, said bag being held by said holding means in said container in an outwardly facing position, and an alcohol indicater tube having one end of a dimension to slidably engage into the fitment neck and into the opening of said measuring bag and adapted to be held by said clamping elements.

3,917,457
PHOSPHORIC ACID REACTOR

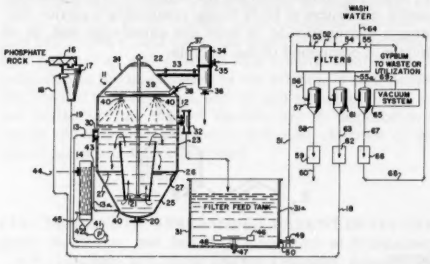
Ralph C. Bergstrom, Chicago, Ill., assignor to Whiting Corporation, Harvey, Ill.

Division of Ser. No. 857,276, Aug. 25, 1969, abandoned, which is a continuation-in-part of Ser. No. 607,692, Jan. 6, 1967, abandoned. This application Apr. 1, 1971, Ser. No. 130,225

Int. Cl.[2] C01B *25/16;* **B01J** *1/00*

U.S. Cl. 23—259.2 **5 Claims**

1. A combination reactor and cooler unit for manufacture of wet process phosphoric acid comprising: a vessel which is at least partially enclosed and adapted to operate with an enclosed freeboard space above a body of reaction slurry contained therein; means for maintaining a predetermined slurry level in said vessel; a vacuum source communicating with said freeboard space for maintaining a subatmospheric pressure in said freeboard space; flow directing means and first forced circulation means operatively associated therewith mounted in said vessel for circulating said body of reaction slurry in a primary flow pattern adapted to expose substantially the entire body of reaction slurry to said subatmospheric pressure in said freeboard space at a first rate sufficient to provide complete recirculation of substantially said entire body of reaction slurry at least once every five minutes; a secondary flow circuit operatively connected to said vessel,



said secondary flow circuit having an inlet and outlet which communicate with said vessel below said means for maintaining said predetermined slurry level; heater means mounted in said secondary flow circuit for heating slurry circulated therethrough; and, second forced circulation means operatively associated with said secondary flow circuit for circulating a portion of said reaction slurry through said secondary circuit at a rate which will provide a residence time during and after heating of said portion of reaction slurry circulated through said secondary flow circuit of not longer than 30 seconds, the flow rate of said secondary circuit not exceeding 50% of the primary flow rate in said vessel.

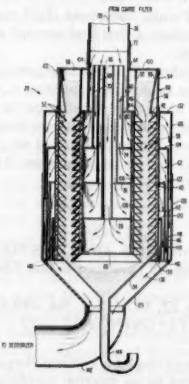
3,917,458
GAS FILTRATION SYSTEM EMPLOYING A FILTRATION SCREEN OF PARTICULATE SOLIDS

Zednek Polak, Montreal, Canada, assignor to Frank S. Nicoll, Jr., Owings Mills, Md. and Zednek Polak, Montreal, Canada, a part interest to each

Filed July 21, 1972, Ser. No. 273,913

Int. Cl.[2] B01D *23/12, 45/12;* **F23C** *9/04*

U.S. Cl. 23—262 **7 Claims**



1. A gas filtration system for treating the products of com-

bustion intermediate of the source and a stack discharging the same comprising:

means downstream of the source for subjecting the products of combustion to high intensity flame,

a plurality of series connected filters coupled to said high intensity flame producing means downstream thereof,

at least one of said filters comprising a plurality of sets of spaced, oppositely inclined louvers, converging in a downstream direction, with the louvers of each set being laterally spaced and supporting therebetween an essentially continuous screen of filter particulate material,

means defining intake and discharge ducts on respective sides of said louvers for delivering gas under pressure to said louver sets and removing treated gas therefrom,

axially and transversely directed baffle members on the intake and discharge sides of respective louvers for insuring uniform gas flow at uniform velocity through said particulate filter material screen,

and wherein said louvers comprise axially spaced, paired inner and outer annular rings with opposed rings defining louver sets and said baffle members comprise an internal set of spaced, concentric tubes whose diameters vary inversely with their length and having intake ends lying in a common plane and having flanges directed radially outwardly therefrom in a transverse direction at their discharge ends with the flange peripheries juxtaposed to said intake louvers and an external set of concentric tubes whose diameters vary directly with their length and having their discharge ends in a common plane and carrying internally directed transverse flanges at their opposite ends with the peripheries of the same terminating in juxtaposed position to the outer peripheries of said outer rings.

3,917,459

APPARATUS FOR THE PRODUCTION OF VERNEUIL CRYSTALS

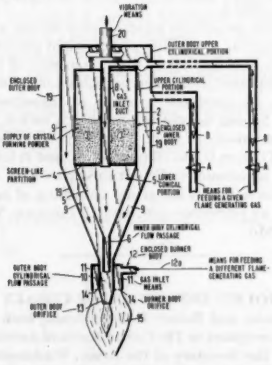
Richard Falckenberg, Unterhaching, and Herbert Lindner, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed May 13, 1974, Ser. No. 469,503

Claims priority, application Germany, May 16, 1973, 2324783

Int. Cl.[2] E01D *9/00*

U.S. Cl. 23—273 V **6 Claims**



1. An apparatus for producing a Verneuil crystal, comprising:

an enclosed hollow outer body having a vertical axis and being defined by an upper cylindrical portion joined to a lower conical portion, said lower conical portion having a cylindrical flow passage at a lower end of said outer body with an orifice communicating with ambient atmosphere and being in concentric relation to said vertical axis, said upper cylindrical portion having a gas inlet means;

an enclosed hollow inner body mounted within said outer body and having a vertical axis in substantial coinciding alignment with the vertical axis of said outer body so as to define a flow passageway between inner walls of said outer body and outer walls of said inner body, said inner body being gas impermeable in relationship to said outer body, said inner body being defined by an upper cylindrical portion joined to a lower conical portion, said inner body having a screen-like partition rigidly attached to interior walls of said inner body at the juncture of said upper and lower portions of said inner body, said inner body having a gas inlet duct mounted concentrically in respect to the vertical axis of said inner body and extending from an upper end of said body to at least said screen-like partition, said lower conical portion of the inner body having a cylindrical flow passage at the lower end of said inner body and extending into said outer body cylindrical flow passage so as to define a coinciding common portion aligned coincidentally with the vertical axis of said outer body, said inner body cylindrical flow passage terminating prior to said orifice of said outer body cylindrical flow passage;

an enclosed burner body attached to said body along the outer body cylindrical flow passage and at a point above said orifice of the outer body cylindrical flow passage; said burner body having an orifice at a lowermost portion of said burner body concentrically encompassing said orifice of the outer body cylindrical flow passage, said burner body having a gas inlet means spaced from said orifice of the outer body cylindrical flow passage;

means for controllably feeding a first flame-generating reactive gas to said gas duct within the inner body and to said gas inlet means within the burner body;

means for controllably feeding second flame-generating reactive gas to said gas inlet means within the outer body; a supply of crystal-forming powder on said screen-like partition within the inner body; and

vibration means positioned in working relation with at least said upper cylindrical portion of the inner body.

3,917,460

WET COMBUSTION OF WASTE LIQUORS

John Edward Morgan, Burnie, Australia, assignor to Associated Pulp & Paper Mills Limited, Melbourne, Australia

Division of Ser. No. 176,651, Aug. 31, 1971, Pat. No. 3,849,536. This application Apr. 1, 1974, Ser. No. 456,766

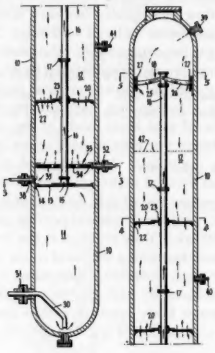
Claims priority, application Australia, Aug. 31, 1970, 2374/70

Int. Cl.[2] B01J *3/00;* **C02C** *5/04*

U.S. Cl. 23—283 **6 Claims**

1. Apparatus for the wet combustion of waste liquors containing combustible components, comprising a generally vertical single pressure vessel divided into a lower compartment and an upper compartment by an imperforate substantially horizontal wall, an inlet pipe near the lower end of the lower compartment for continuously admitting a mixture of waste liquor and air under pressure to the lower end of the lower compartment, a generally vertical transfer pipe disposed axially in the upper compartment and communicating at its lower end with the upper end of the lower compartment through an aperture in the said horizontal wall, the upper end of the transfer pipe terminating near the upper end of the upper compartment and being connected at its upper end to a gas-liquid separating device which is capable of substantially separating the gaseous and liquid phases passing upwardly through the transfer pipe, the separated liquid phase being permitted to flow continuously downwardly in the said upper compartment; a gas discharge vent in the pressure vessel near the upper end of the upper compartment through which vent gas continuously can discharge; a second inlet pipe which

communicates directly with a distributing device within and near the lower end of the said upper compartment and through which air under pressure is continuously admitted to



the upper compartment and passes upwardly through the liquid therein, and a liquor discharge outlet near the lower end of the said upper compartment, enabling a continuous discharge of such liquor.

3,917,461

APPARATUS FOR PRODUCTION OF GASEOUS PRODUCTS

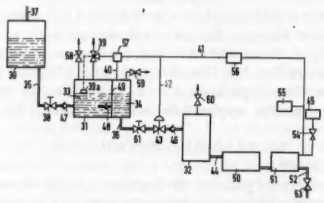
Dieter Kühl, Rathsberger, Germany, and Manfredo Marchetto, Viale Oleandri, Italy, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Feb. 15, 1973, Ser. No. 332,654

Claims priority, application Germany, Feb. 16, 1972, 2207274; Feb. 16, 1972, 2207273

Int. Cl. B01j *7/02, 9/04*

U.S. Cl. 23—288 A **24 Claims**



1. Apparatus for producing a gas from a liquid decomposable into the gas, comprising first and second fluid-tight chambers, a gravity supply source of the liquid said gravity supply source being connected to the first chamber for gravity flow thereto through a check valve preventing reverse flow, the first chamber being connected for gravity liquid flow to the second chamber through a check-valve preventing reverse flow, means for enclosing fluid-tightly and decomposing the liquid to the gas under pressure and connected to receive a gravity liquid flow from the second chamber through a pressure-responsive flow control valve and having a gas output conduit for serving a consumer, a branch conduit connected to the output conduit and to the first and the second chamber and to said flow control valve and means responsive to the liquid level in the first chamber which vents said first chamber to control the gravity flow thereto from said source to maintain a predetermined liquid level in the first chamber.

3,917,462

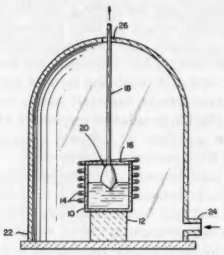
METHOD OF PRODUCING SODIUM BETA-ALUMINA SINGLE CRYSTALS

Paul J. Yancey, Mentor, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed July 26, 1974, Ser. No. 492,279

Int. Cl.² B01J *17/18*

U.S. Cl. 23—301 SP **4 Claims**



1. A method for producing single crystals of sodium beta alumina $Na_2O.5Al_2O_3$ to $Na_2O.11Al_2O_3$, which comprises

i. providing a melt having a composition of $Na_2O.5Al_2O_3$ to $Na_2O.11Al_2O_3$ in a gaseous environment at a pressure of 760 mm ± 50% pressure and containing oxygen in an amount of between about 5000 to 15,000 parts per million,

ii. contacting the melt with a seed crystal of sodium beta-alumina and

iii. pulling melt material with said seed crystal to form an elongate single crystal of sodium beta-alumina.

3,917,463

NICKEL-BASE HEAT RESISTANT AND WEAR RESISTANT ALLOY

Hidekazu Doi, and Kenichi Nishigaki, both of Omiya, Japan, assignors to Mitsubishi Metal Corporation, Tokyo, Japan

Filed Feb. 11, 1974, Ser. No. 441,106

Claims priority, application Japan, Feb. 16, 1973, 48-18328

Int. Cl.² C22C *29/00, 19/08*

U.S. Cl. 29—182.8 **4 Claims**

1. A powder metallurgy sintered alloy having a basic composition consisting essentially of, in weight percent based on the total weight of said alloy, from 10 to 90% of substantially uniformly dispersed preformed particles composed of at least one carbide or composite carbide of transition metals of Groups 4*a*, 5*a* and 6*a* and the balance a nickel base matrix consisting essentially of from 70 to 90 percent Ni, from 2 to 10 percent Ti, from 0.5 to 10 percent Al, and at least one alloy element, in an amount sufficient to impart high temperature strength, selected from the group consisting of up to 10 percent Ta, up to 10 percent Nb, up to 20 percent W and up to 20 percent Mo.

3,917,464

ELECTROLESS DEPOSITION OF COBALT BORON

Fred Pearlstein, and Robert F. Weightman, both of Philadelphia, Pa., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 20, 1973, Ser. No. 381,121

Int. Cl.² C23B *3/00*

U.S. Cl. 29—196.6 **2 Claims**

1. A double layer deposit on steel for providing synergistic protection to said steel against corrosive attack in a saline environment, said double layer deposit comprising an initial electroless nickel-phosphorus layer and a coating thereover of electroless cobalt comprising by weight, 96.0% cobalt, 1.7% boron, 0.97% carbon, and 0.05% nitrogen.

2. Double layer deposit as described in claim 1 further characterized by said nickel-phosphorous layer being about 7.5 microns in thickness and said electroless cobalt layer being about 2.5 microns in thickness.

3,917,465

REMOVAL OF PYRITIC SULFUR FROM COAL USING SOLUTIONS CONTAINING FERRIC IONS

Robert A. Meyers, Encino, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Division of Ser. No. 163,893, July 17, 1971, Pat. No. 3,768,988, which is a continuation-in-part of Ser. No. 116,262, Feb. 17, 1971, abandoned. This application Oct. 30, 1973, Ser. No. 411,597

Int. Cl.² C10L *5/24, 9/00*

U.S. Cl. 44—2 **1 Claim**

1. An apparatus for reducing the pyritic sulfur content of coal comprising in combination:

means adapted to react coal containing iron pyrite with a solution of ferric ion;

washing means for removing reactant solution from the coal; and

means for removing from the coal, free sulfur formed by the reaction between the pyrite and ferric ion.

3,917,466

COMPOSITIONS OF OLEFIN-SULFUR DIOXIDE COPOLYMERS AND POLYAMINES AS ANTISTATIC ADDITIVES FOR HYDROCARBON FUELS

Cyrus Pershing Henry, Jr., Penns Grove, N.J., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Oct. 29, 1974, Ser. No. 518,527

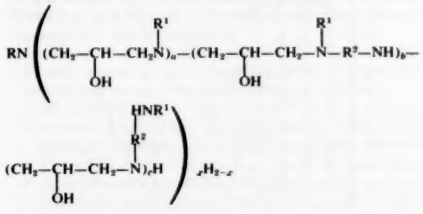
Int. Cl.² C10L *1/22*

U.S. Cl. 44—62 **14 Claims**

1. In an antistatic additive composition for hydrocarbon fuels comprising two components present in a weight ratio of 100:1 to 1:100, wherein one component is a polysulfone copolymer consisting essentially of about 50 mol percent of units from sulfur dioxide, about 40 to 50 mol percent of units derived from one or more 1-alkenes each having from about 6 to 24 carbon atoms, and from about 0 to 10 mol percent of units derived from an olefinic compound having the formula ACH=CHB wherein A is a group having the formula $-C_xH_{2x}-)-COOH$ wherein x is from 0 to about 17, and B is hydrogen or carboxyl, with the proviso that when B is carboxyl, x is 0, and wherein A and B together can be a dicarboxylic anhydride group,

the improvement which comprises, in combination with said polysulfone component,

a polymeric polyamine of the formula



wherein

R^1 is an aliphatic hydrocarbyl group of 8 to 24 carbon atoms,

R^2 is an alkylene group of 2 to 6 carbon atoms,

R is R^1, or, an N- aliphatic hydrocarbyl alkylene group of the formula R^1NHR^2,

a is an integer of 0 to 20,

b is an integer of 0 to 20,

c is an integer of 0 to 20, and

x is an integer of 1 to 2,

with the proviso that when R is R^1 then a is an integer of 2 to 20 and $b=c=o$, and when R is $R^1NH—R^2$ then a is 0 and $b + c$ is an integer of 2 to 20.

3,917,467

PROCESS FOR MANUFACTURING HIGH PURITY METHANE GAS

Tsutomu Toida; Seiichi Matsuoka; Kenzo Yamamoto, and Kouji Tamura, all of Yokohama, Japan, assignors to Japan Gasoline Co., Ltd., Tokyo, Japan

Filed Jan. 8, 1973, Ser. No. 321,821

Claims priority, application Japan, Jan. 14, 1972, 47-5884

Int. Cl.² C10K *3/04*

U.S. Cl. 48—197 R **3 Claims**

1. A process for manufacturing a high purity methane gas which comprises:

passing a gas mixture consisting essentially of methane, steam, hydrogen, carbon monoxide and carbon dioxide through a first methanization reaction zone under adiabatic methanization reaction conditions of a temperature in the range of 250° to 500°C and a pressure in the range of atmospheric pressure to 100 kg/cm²G and in contact with methanization catalyst to produce a first intermediate gas,

cooling said first intermediate gas to a temperature of 40° to 170°C and removing condensed steam therefrom,

passing the remainder of said cooled first intermediate gas through a carbon dioxide absorption zone and therein removing from said cooled first intermediate gas all of the carbon dioxide contained therein in excess of the quantity capable of reacting with the hydrogen contained in said first intermediate gas to produce methane, whereby to obtain a second intermediate gas free of excess carbon dioxide,

raising the temperature of said second intermediate gas and then passing the entirety of said second intermediate gas through one or more additional methanization reaction zones under adiabatic methanization reaction conditions of a temperature in the range of 200° to 400°C and a pressure in the range of atmospheric pressure to 100 kg/cm² G and in contact with methanization catalyst to methanize the remaining carbon monoxide and carbon dioxide, and obtaining from the last of the methanization reaction zones an effluent gas of high purity methane.

3,917,468

SYNTHETIC NATURAL GAS PRODUCTION

Godfried J. Van den Berg, and Frank K. G. Ouwerschuur, The Hague, both of Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 5, 1973, Ser. No. 422,051

Claims priority, application Netherlands, Dec. 15, 1972, 7217059

Int. Cl.² C10J *1/20*

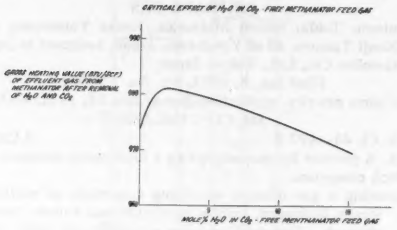
U.S. Cl. 48—199 R **2 Claims**

1. A process for the production of town gas which comprises

a. partially combusting a carbonaceous fuel selected from the class consisting of heavy fuel oil, petroleum distillates or residues, liquid fuel containing process soot and slurries of coal grit in water in a partial combustion zone to produce a hot gaseous product containing hydrogen and carbon monoxide;

b. carburetting the hot gas product of the partial combustion zone maintained at a temperature of between 700° and 1100°C with a volatile liquid hydrocarbon carburant in a carburetting zone thereby effecting volatilization of the carburant into the hot gas and the accompanying thermal cracking of the carburant into methane and lighter unsaturated hydrocarbons, said liquid carburant having a residence time in the carburetting zone between

about 0.1 and 10 seconds and being introduced into the carburetting zone in the form of a thin layer maintained at a temperature below that at which thermal cracking occurs during the time the carburant is not absorbed by the hot gas;


CRITICAL EFFECT OF H_2O IN CO_2 FREE METHANATOR FEED GAS
GROSS HEATING VALUE (BTU/SCF) OF EFFLUENT GAS FROM METHANATOR AFTER REMOVAL OF H_2O AND CO_2
MOLE% H_2O IN CO_2 - FREE METHANATOR FEED GAS

c. passing the carburetted product of the carburetting zone into a hydrogenation zone maintained at elevated temperatures wherein any remaining volatilized hydrocarbon carburant is further decomposed by thermal cracking and the unsaturated hydrocarbon compounds are hydrogenated and;

d. cooling the hot gaseous product of the hydrogenation zone.

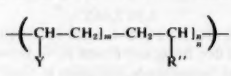
3,917,469

METHOD FOR THE REMOVAL OF SULFUR DIOXIDE FROM GAS MIXTURES

Robert J. Cotter, Bernardsville, and Michael J. Keogh, Somerville, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.

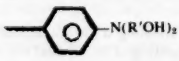
Filed July 24, 1974, Ser. No. 491,601
Int. Cl.² B01D *53/02*
U.S. Cl. 55—73 **16 Claims**

1. Method for removing SO_2 from gas mixtures containing moisture which comprises contacting said gas mixtures at a temperature of about 0° to 90°C. with a normally solid polymer having repeating groups represented by the formula:

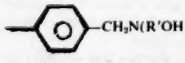


wherein Y is a monovalent radical selected from the group consisting of

$-N(R)_2$
$-NHR'OH$
$-N(R'OH)_2$



or



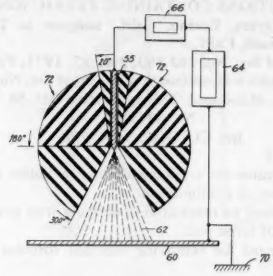
wherein R is alkyl containing 1 to 18 carbon atoms, R′ is an alkylene group containing 1 to about 6 carbon atoms, R″ is a monovalent radical selected from the group consisting of: hydrogen, lower alkyl groups having up to about 4 carbon atoms, halogen or phenyl, *m* is an integer having a value of about 50 to about 500 and *n* is an integer having a value of 0 to about 500.

3,917,470

ELECTROSTATIC PRECIPITATOR

Pavel Xmris, 224 W. Walk, West Haven, Conn. 06516, and Nicholas B. Franco, 93 Main Drive, Brookfield, Conn. 06804

Continuation of Ser. No. 76,047, Sept. 28, 1970, abandoned. This application Sept. 19, 1973, Ser. No. 398,890
Int. Cl. B03c *3/08*
U.S. Cl. 55—139 **2 Claims**



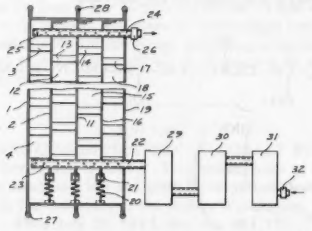
1. For use in an electrostatic precipitator circuit for purifying a gas and including an optical electrostatic generator in series therewith and between said precipitator and a direct current power supply, an electrode system comprising a substantially planar discharge electrode, a collection electrode longitudinally aligned with and spaced from the discharge electrode, means for guiding a gas stream between the electrodes, and power means connected to said electrodes for maintaining a glow discharge between the electrodes, said discharge electrode having at least one edge portion substantially closer to the collection electrode than the remainder of the discharge electrode, and insulator shields along the sides of said discharge electrode receding from adjacent said closer edge portion to an outer portion, said shields having a outer section which describes an arc.

3,917,471

INSULATING FLEXIBLE COMPOSITE ELEMENT AND PURGE SYSTEM

Otto Alfred Becker, Robert-Koch-Strasse 59, 66 Saarbruecken 6, Germany

Division of Ser. No. 125,549, March 18, 1971, Pat. No. 3,811,239. This application May 1, 1974, Ser. No. 465,848
Int. Cl.² B01D *51/00*
U.S. Cl. 55—267 **5 Claims**



1. An insulating flexible composite element comprising at least two spaced walls formed of flexible material having reflecting inner surfaces, said walls being spaced from each other in a shape retaining manner by at least one flexible spacing element formed of a perforated, soft, elastic, heat-insulating material, the perforations in said spacing element each forming a radiation chamber with the opposed walls of

said flexible material, said radiation chambers with its reflecting walls and spacing element being enclosed by sheets of flexible material forming an envelope around said flexible walls, said envelope forming a unitary part of the insulating flexible composite element, and means including valves for introducing dry gas into and discharging moist gas from said chambers of said envelope.

3,917,472

APPARATUS FOR PURIFYING A RAW GAS OR SUSPENDED SOLID PARTICLES

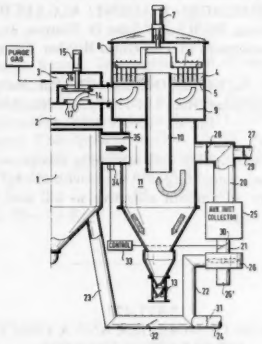
Wolfgang Berz, Mauerkircherstrasse 13, 8000 Munich 80, Germany

Filed Sept. 23, 1974, Ser. No. 508,434

Claims priority, application Germany, Oct. 15, 1973, 2351613

Int. Cl.[2] B01D *41/02*

U.S. Cl. 55—282 **6 Claims**



1. In an apparatus for purifying a raw carrier gas of solid particles suspended in said gas, the apparatus including a housing defining a filtering chamber therein, a layer of particulate filtering medium dividing said chamber into a first compartment and a second compartment, a centrifugal separator, a conduit connecting said separator to said first compartment, a source of said raw carrier gas, first connecting means connecting said source with said separator, a source of purging gas, second connecting means connecting said source of purging gas to said second compartment, and discharge means for discharging purified gas from said second compartment, the improvement which comprises:

an auxiliary circuit providing a flow path from said separator to said source of said carrier gas separate from said first connecting means, said auxiliary circuit including

a. an auxiliary dust collector;

b. conveying means for conveying gas from said centrifugal separator through said auxiliary circuit and said auxiliary dust collector to said source of said raw carrier gas;

c. pressure sensing means in said first connecting means for sensing the gas pressure prevailing in said first connecting means;

d. a control valve in said auxiliary circuit intermediate said separator and said source of raw gas for controlling flow of gas in said path; and

e. valve operating means connected to said sensing means and to said control valve for operating said control valve in response to a change in the pressure sensed by the sensing means.

3,917,473

HIGH PRESSURE SEPARATOR

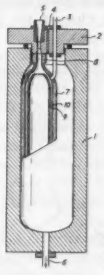
Rene Fournie, Pau, France, assignor to Societe Nationale des Petroles d'Aquitaine, Courbevoie, France

Filed Feb. 19, 1974, Ser. No. 443,252

Claims priority, application France, Feb. 21, 1973, 73.06122

Int. Cl.[2] B01D *45/12*

U.S. Cl. 55—310 **10 Claims**



1. A high-pressure separator for a polyphase mixture consisting of a gas mixed with a liquid, solid or viscous product, said separator comprising a vertical jacket having openings in its upper part receiving a mixture inlet pipe, a separated gas outlet pipe, and a safety device in an outlet of said jacket responsive to excessive pressure within said separator, and an opening in its lower part serving as an outlet for said product, the improvement according to which said separator further comprises:

means for centrifugally separating said mixture comprising a first inner cylinder within said jacket, which cylinder is open at its lower end, a connector defining a duct connecting the upper end of said first cylinder to the outlet receiving said safety device, said jacket and first cylinder defining a first space therebetween, through which said duct passes,

a second inner cylinder coaxially mounted within said first cylinder open at its lower end, said first and second cylinders defining a second space therebetween, with said mixture inlet pipe opening into said second space and said gas outlet pipe opening into said first space, the lower ends of said cylinders being spaced from the lower end of the jacket.

3,917,474

RECEIVER-SEPARATOR UNIT FOR LIQUID INJECTED GAS COMPRESSOR

Frederick William Heckenkamp, and Francis M. Wensing, both of Quincy, Ill., assignors to Gardner-Denver Company, Dallas, Tex.

Filed Sept. 9, 1974, Ser. No. 504,411

Int. Cl.[2] B01D *50/00*

U.S. Cl. 55—332 **3 Claims**

1. A receiver-separator tank for a liquid injected gas compressor system comprising:

an elongated tank portion forming a first compartment and comprising a liquid reservoir;

a conduit extending into said portion for conducting a gas-liquid mixture into said first compartment;

a section of said tank forming a second compartment and comprising a vertically disposed cylindrical section formed integral with said elongated tank portion and including a side wall portion extending into said elongated tank portion;

a partition between said first and second compartments formed by a transverse plate disposed across the lower

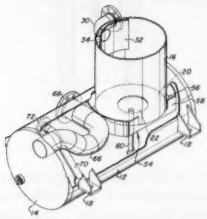
end of said tower section which is disposed in said elongated tank portion;

an opening in said plate for admitting a gas-liquid mixture to said second compartment;

an outlet conduit disposed on the side wall of said tower section above said elongated tank portion and connected to said second compartment;

liquid separator means comprising a hollow cylindrical element having a porous wall structure and disposed in said second compartment to have one end in sealing engagement with said plate and surrounding said opening; means forming a closure for the end of said element opposite said one end;

said element defining an interior space for receiving a gas-liquid mixture through said opening whereby said mixture



flows generally outwardly through said element for separation of liquid from said mixture and whereby substantially liquid-free gas then exits said second compartment through said outlet conduit;

a head closing the end of said tower section opposite said lower end, said head being removably attached to said tower section for providing access to said element for removal of said element from said tower section; and,

a generally pan shaped baffle including a bottom part disposed in spaced apart relationship with respect to said plate and below said plate, said baffle including a side wall extending upwardly from said bottom part, said baffle being positioned with respect to said opening in said plate so as to require substantially a reversal in flow direction of the gas liquid mixture passing from said first compartment to said second compartment.

RJW

3,917,475

LIQUID FERTILIZER COMPOSITION AND PROCESS

William Percy Moore, Hopewell, Va., and John Harvey Agee, Baton Rouge, La., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Apr. 12, 1974, Ser. No. 460,318

Int. Cl.[2] C05B *1/00*

U.S. Cl. 71—34 **3 Claims**

1. In a process for production of an ammonium phosphate fertilizer solution which comprises the following steps:

a. providing a concentrated wet-process phosphoric acid containing 60–65% P_2O_5;

b. continuously reacting said concentrated acid with substantially anhydrous ammonia at a temperature of 425°–460°F. for 5–60 seconds, sufficient ammonia being reacted with the acid to produce a reaction melt having a nitrogen to P_2O_5 weight ratio between about 0.12 and 0.29, whereby the polyphosphate content of the melt is increased to 20–40% of the total P_2O_5;

c. continuously quenching the resulting reaction melt in aqueous ammonia of sufficient concentration to form a clear solution containing 10–13% nitrogen and 33–37% P_2O_5 having 20–40% of the total P_2O_5 in polyphosphate form, said solution containing filterable solids; and

d. separating the solids to recover a clear solution consisting essentially of ammonium orthophosphate and ammonium pyrophosphate, which solution remains substantially free from precipitated solids for at least 90 days at normal temperatures; the improvement comprising:

1. preheating the concentrated wet-process phosphoric acid utilized in step (b) in a conventional steam-heated heat exchanger to a temperature of 240°–275°F.;

2. further preheating said concentrated wet-process phosphoric acid to a temperature of 300°–400°F. by indirectly heating the acid with the hot reaction melt in step (b) in a heat exchanger using a circulating liquid heat exchange medium;

3. preheating the substantially anhydrous ammonia utilized in step (b) in a conventional steamheated heat exchanger to a temperature of 240°–275°F.; and

4. further preheating said ammonia to a temperature of 300°–400°F. by indirectly heating the ammonia with the hot reaction melt in step (b) in a heat exchanger using a circulating liquid heat exchange medium.

3,917,476

DIETHYL ALPHA PHOSPHONATE AS AN (ANTIMICROBIAL AGENT) ALGAECIDE

Al F. Kerst, Alma, Mich., and John D. Douros, Jr., Gaithersburg, Md., assignors to The Gates Rubber Company, Denver, Colo.

Division of Ser. No. 84,903, Oct. 28, 1970, Pat. No. 3,783,160. This application Mar. 12, 1973, Ser. No. 340,404

Int. Cl.[2] A01N *9/36*

U.S. Cl. 71—67 **11 Claims**

1. A method of killing and inhibiting the growth of algae which comprises contacting said algae with diethyl alpha allyl phosphonate in an amount effective to kill and inhibit the growth of said algae.

3,917,477

PLANT GROWTH MODIFIER AND A PROCESS FOR PREPARATION THEREOF

Tohru Hashimoto, Musashino; Akira Kawarada, and Sachiko Tamura, both of Tokyo, all of Japan, assignors to Rikagaku Kenkyusho, Japan

Filed Feb. 12, 1973, Ser. No. 331,498

Claims priority, application Japan, Feb. 14, 1972, 47-15345; Dec. 26, 1972, 48-3299

Int. Cl.[2] A01N *5/00*

U.S. Cl. 71—76 **17 Claims**

1. A composition useful for inhibiting the growth and germination of higher plants which comprises as the active ingredient an effective amount of 2,2′-dihydroxy-3,5-dimethoxybibenzyl or 3,3′-dihydroxy-5-methoxybibenzyl in combination with an inert solid or liquid diluent or carrier.

3,917,478

HERBICIDAL COMPOSITIONS AND METHODS UTILIZING THIADIAZOLIS UREAS

Hans Moser, Basel, and Christian Vogel, Binningen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

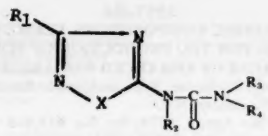
Division of Ser. No. 123,446, March 11, 1971, Pat. No. 3,822,280. This application Apr. 25, 1974, Ser. No. 464,088

Claims priority, application Switzerland, Mar. 19, 1970, 4159/70

Int. Cl.[2] A01N *9/12*

U.S. Cl. 71—90 **15 Claims**

1. A herbicidal composition for combatting weeds in crop cultures which comprises a herbicidally effective amount of a compound of the formula



wherein

R_1 represents α-halogen lower alkyl,

R_2 and R_3 each independently represents hydrogen or lower alkyl,

R_4 represents lower alkyl optionally substituted by cyano or alkoxy of from 1 to 4 carbon atoms, cycloalkyl of from 3 to 10 carbon atoms, alkoxy of from 1 to 4 carbon atoms, alkenyl or halogenoalkenyl of 3 or 4 carbon atoms, or alkynyl of 3 to 4 carbon atoms, and

X represents oxygen or sulphur;

together with a suitable carrier therefor.

3,917,479

FURNACES

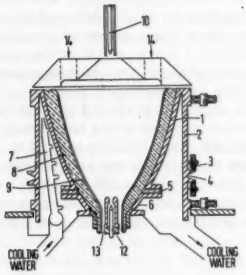
Ian George Sayce, Teddington, and Francis Henry Howie, Hampton, both of England, assignors to National Research Development Corporation, London, England

Continuation-in-part of Ser. No. 311,153, Dec. 1, 1972, abandoned. This application Dec. 18, 1973, Ser. No. 425,939

Claims priority, application United Kingdom, Dec. 3, 1971, 56324/71; Apr. 5, 1972, 15682/72

Int. Cl. C22d 7/00

U.S. Cl. 75—10 R **7 Claims**



1. A process for treating molten materials comprising the operations of introducing material through an orifice defined at the upper end of a vertical furnace;

heating the material by an electric arc between at least two electrodes one of which is mounted in the furnace roof; rotating the furnace about a vertical axis at such a speed that the molten material forms a liquid wall the internal surface of which approximates to a paraboloid of revolution;

withdrawing molten material from an exit orifice defined in the base of said furnace; and

adding further raw material to the molten material present in the furnace while maintaining said electrical arc.

3,917,480

PROCESS FOR PREPARING THE FEED SOLID CHARGE FOR FLUID BED REACTORS

Giansilvio Malgarini; Emilio Marino, and Edoardo Pasero, all of Rome, Italy, assignors to Centro Sperimentale Metallurgico S.p.A., Rome, Italy

Filed July 3, 1974, Ser. No. 485,569

Claims priority, application Italy, Aug. 6, 1973, 51856/73

Int. Cl.² C22B 1/10

U.S. Cl. 75—26 **9 Claims**

7. A process as claimed in claim 1, in which said pellets have an average particle size of about 1 mm.

3,917,481

LIQUID CRYSTAL COMPOSITIONS BETWEEN ELECTRODES, ONE OF WHICH IS A PHOTOCONDUCTOR

Franklin D. Saeva, and Richard L. Schank, both of Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 228,958, Feb. 24, 1972, Pat. No. 3,819,531. This application Feb. 14, 1974, Ser. No. 442,568

Int. Cl.² G03G 9/00, 5/04

U.S. Cl. 96—1 R **1 Claim**

1. An imaging method comprising the steps of

a. providing an imaging member comprising a layer of liquid crystalline composition having the optical properties of the cholesteric liquid crystalline mesophase arranged between a pair of electrodes wherein at least one of said electrodes includes a photoconductive insulating surface adjacent said liquid crystal layer and at least one of said electrodes is substantially transparent, said composition consisting essentially of at least one nematic liquid crystalline material and at least one non-mesomorphic optically active material which is represented by a general formula selected from the group consisting of

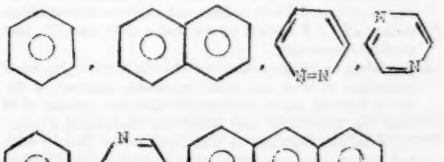
$$W-Ar-Z, \text{ and}$$

$$W-Ar-X=Y-Ar-Z$$

where X and Y are radicals chosen from the group consisting of

$$X=Y=CH$$
$$X=CH, Y=N$$
$$X=Y=N$$
$$X=N, Y=N\rightarrow O$$
$$X=CH, Y=N\rightarrow O$$

where *W* and *Z* can be the same or different and are chosen from the group consisting of NH_2 and alkenyl, alkynyl, alkoxy, alkyl, ester, carbonate and aldehyde radicals having up to and including nine carbon atoms, and where Ar is chosen from the group consisting of



; and

b. establishing a uniform electrical field between said electrodes and exposing said photoconductive surface to an imagewise pattern of activating electromagnetic radiation

whereby the image portions of said layer are distinguishable from the background portions of said layer.

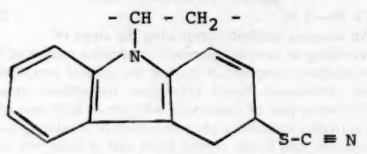
3,917,482

PHOTOCONDUCTIVE POLYMERS OF THIOCYANO-SUBSTITUTED-9-VINYLCARBAZOLES

Takeshi Fida, Chiba; Katsuhiko Nishide, Tokyo; Teruo Yamanouchi, Fujisawa, and Kikuo Kinjo, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 396,700, Sept. 13, 1973, abandoned, which is a continuation of Ser. No. 195,852, Nov. 4, 1971, abandoned. This application July 18, 1974, Ser. No. 489,530
Claims priority, application Japan, Nov. 9, 1970, 45-98528
Int. Cl.² G03G 5/06
U.S. Cl. 96—1.5 4 Claims

1. Electrophotographic photosensitive material which consists essentially of a polymer selected from the group consisting of (1) homopolymers of a thiocyano-substituted9-vinylcarbazole unit represented by the formula:



and (2) copolymers of said thiocyano-substituted9-vinylcarbazole with at least one monomer copolymerizable therewith.

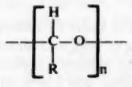
3,917,483

PHOTOINDUCED ACID CATALYZED DEPOLYMERIZATION OF DEGRADABLE POLYMERS

William W. Limburg, Penfield, and Dana G. Marsh, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 1, 1973, Ser. No. 411,603
Int. Cl.² G03C 5/04, 1/58
U.S. Cl. 96—27 R 18 Claims

1. An imaging method based upon ultraviolet light induced acid catalyzed degradation of a composition comprising at least one acid degradable polymer of the formula:



wherein

R is an aliphatic hydrocarbon radical of 1 – 6 carbon atoms a chlorinated aliphatic hydrocarbon radical of 1 – 6 carbon atoms, or a nitrile substituted aliphatic hydrocarbon radical of 1 – 5 carbon atoms; and *n* is at least 50 said method comprising:

a. providing an imaging member wherein the imaging layer comprises at least one acid degradable polymer of the above formula and a catalytically effective amount of at least one latent acid, said latent acid comprising a material generally regarded as non-acidic in the ground state but, which upon irradiation with ultraviolet light undergoes an electronic transition from the ground to the excited state whereupon a proton becomes dissociated from said latent acid and is released into the imaging layer containing the degradable polymer; and

b. irradiating said layer in imagewise configuration with ultraviolet light for an interval sufficient to cause protolytic dissociation of the latent acid.

3,917,484

PHOTOGRAPHIC COMPOSITIONS, ELEMENTS AND PROCESSES FOR THE PRODUCTION OF FORMAZAN DYE IMAGES OF ENHANCED RED ABSORPTION

David S. Bailey, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 3, 1974, Ser. No. 457,960
Int. Cl.² G03C 5/24
U.S. Cl. 96—48 R 21 Claims

1. A composition of matter comprising

means for providing labile hydrogen atoms,

means for generating, by molecular photolysis or photo-induced rearrangement, a reducing agent for tetrazolium salts or a compound which will form a reducing agent for tetrazolium salts only when activated by a base or by heat, and

a tetrazolium salt capable of reduction to a formazan dye including

a. as a 5-position substituent a benzene ring attached to the tetrazole nucleus having at least one meta or para alkyl or alkoxy substituent and

b. 2- and 3-position tetrazole nucleus substituents which are, collectively, predominantly electronegative.

3,917,485

METHOD OF MAKING PHOTOGRAPHIC SILVER HALIDE EMULSIONS AND PRODUCTS THEREOF

John Morgan, Ruislip, England, assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 431,453, Jan. 7, 1974, abandoned. This application Sept. 3, 1974, Ser. No. 502,695
Int. Cl.² G03C 1/36, 1/02, 1/08
U.S. Cl. 96—101 18 Claims

1. A method of making an internally sensitive photographic silver halide emulsion in which additional silver halide is precipitated onto silver halide grains of a surface sensitive or surface fogged silver halide emulsion characterized in that alternate excesses of silver ions and halide ions are caused to be present during precipitation.

2. A method according to claim 1 characterized in that the alternate excesses comprise a pAg adjustment cycle in which sufficient silver salt is caused to be present to adjust the pAg of the emulsion so that an excess of silver ions are present as compared to halide ions and sufficient alkali metal halide salt is then caused to be present to adjust the pAg so that an excess of halide ions are present as compared to silver ions.

3,917,486

IMMERSION TIN BATH COMPOSITION AND PROCESS FOR USING SAME

Frederick W. Schneble, Jr., Oyster Bay, N.Y., assignor to Photocircuits Division of Kollmorgen Corporation, Hartford, Conn.

Filed July 24, 1973, Ser. No. 382,056
Int. Cl.² C23C 3/00
U.S. Cl. 106—1 8 Claims

1. An immersion tin plating bath composition for depositing a smooth, even tin coating on metallized surfaces capable of chemically displacing tin from a tin plating bath, said composition comprising

Soluble stannous salt	15–30 g/l
Sulfur component	15–120 g/l
Mineral acid	25–50 ml/l
Wetting agent	0.1–10 g/l
Water	Balance

said sulfur component comprising at least two sulfur-containing compounds selected from the group consisting of organic sulfur compounds and inorganic sulfur compounds, said organic sulfur compounds selected from the group consisting of aliphatic sulfur-nitrogen compounds, 5- and 6-membered heterocyclic compounds containing S-N in the ring, dithiols, thio derivatives of alkyl glycols, and thioamine acids, and said inorganic sulfur compounds selected from the group consisting of alkali metal sulfides, alkali metal thiocyanates, and alkali metal dithionates.

3,917,487
CADMIUM-CONTAINING SILVER CONDUCTOR COMPOSITIONS

Oliver Alton Short, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed Dec. 28, 1973, Ser. No. 429,077
Int. Cl.² C09D *5/24*
U.S. Cl. 106—1 **6 Claims**

1. In a powder composition, for producing conductive patterns on a dielectric substrate comprising finely divided silver and finely divided inorganic binder, the improvement comprising finely divided elemental cadmium powder in an amount effective to increase the solder leach resistance of conductors thereof.

3,917,488
HIGH ELASTIC MODULUS BORATE GLASS

Joseph W. Malmendier, South Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Continuation-in-part of Ser. No. 269,982, July 10, 1972, abandoned. This application Apr. 29, 1974, Ser. No. 464,935
Int. Cl.² C03C *13/00, 3/00*
U.S. Cl. 106—50 **3 Claims**

2. A glass fiber exhibiting an elastic modulus in excess of 13 × 10^6 psi consisting essentially, by weight on the oxide basis, of about 7–26% MgO, 10–45% Al_2O_3, 20–45% B_2O_3, and up to 50 percent total of at least one high field strength modifier in the indicated proportion selected from the group consisting of 0–10% TiO_2, 0–40% Ta_2O_5, 0–50% La_2O_3, 0–25% CeO_2, 0–10% ZrO_2, 0–35% Y_2O_3, and 0–15% BeO, the total of MgO + BeO not exceeding about 26 percent, said glass being essentially free from SiO_2, P_2O_5, the alkali metal oxides other than Li_2O, and the alkaline earth metal oxides other than MgO.

3,917,489
CERAMIC COMPOSITION AND METHODS

John E. Waters, Jr., 1539 Buena Vista, Apt. 1, San Clemente, Calif. 92672

Filed June 10, 1974, Ser. No. 477,829
Int. Cl.² C04B *11/10*
U.S. Cl. 106—110 **12 Claims**

1. The composition which comprises:

a quantity of calcium sulfate plaster and a lesser quantity of frit;

the volume of frit being no less than 20 percent of the volume of plaster.

3,917,490
METHOD OF GRINDING SOLDER GLASSES

William E. Brown, Walnut Creek; Charles A. Levine, Clayton, and Floris Y. Tsang, Concord, all of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 23, 1974, Ser. No. 535,250
Int. Cl.² H01M *35/00*
U.S. Cl. 136—6 F **15 Claims**

1. A process for grinding alkali metal borate glasses of high borate contents which comprises:

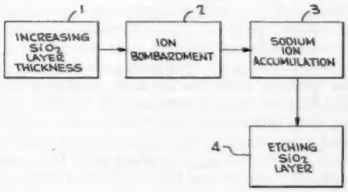
1. providing particles of an alkali metal borate solder glass having effective diameters of at least 2 microns and consisting essentially of boron trioxide and sodium oxide, potassium oxide or a mixture thereof; the content of boron trioxide in said glass being from about 90 to about 98 wt. %;
2. grinding said particles while contacting them with an aliphatic amine, at a temperature at which the vapor pressure of the amine is at least 1 mm Hg but less than the alteration temperature of the amine or the softening point of the glass, whichever is lower, until at least some of said particles have been converted to fragments thereof which have effective diameters of less than one micron and are coated with at least a monomolecular layer of the amine, said amine containing at least one chain of at least 12 carbons and a total of up to 42 carbons.

5. The process of claim 3 in which said paste is shaped by so disposing it that the unitary glass body formed upon said curing and fusing constitutes a tube-sheet member adapted to be incorporated in a high temperature battery cell in which the electrolyte/separator consists of a glass to which said solder glass will bond.

3,917,491
METHODS FOR FABRICATING RESISTANT MOS DEVICES

Robert B. Oswald, Jr., Bethesda, and Anthony J. Baba, Gaithersburg, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 8, 1974, Ser. No. 431,822
Int. Cl.² H01L *7/54*
U.S. Cl. 148—1.5 **4 Claims**



1. A method for enabling a metal-oxide semiconductor device to withstand the effects of a high radiation environment comprising the steps of:

a. increasing the thickness of the oxide layer;
b. directing a beam of negative ions into the oxide layer;
c. implanting said beam of negative ions only in the uppermost 1,000 Angstroms of said oxide layer and then
d. allowing the sodium atoms in the oxide layer to accumulate on the surface of said layer as sodium atoms and ions; and
e. removing said sodium atoms and ions.

3,917,492
METHOD OF MAKING STAINLESS STEEL

Anders Lars Erik Backman, and Stig Gunnar Forsberg, both of Sandviken, Sweden, assignors to Sandvik Aktiebolag, Sandviken, Sweden

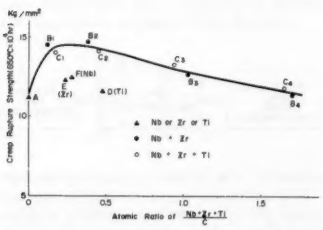
Filed June 7, 1974, Ser. No. 477,469
Claims priority, application Sweden, June 8, 1973, 7308126
Int. Cl.[2] C21D 7/02
U.S. Cl. 148—12 E **3 Claims**

1. A method of making austenitic stainless steels having high tensile strength in excess of 250,000 p.s.i. but not in excess of 400,000 p.s.i. and preferably not in excess of 390,000 p.s.i., with high ductility in excess of 45% in terms of contraction of area before rupture and good properties under elevated temperature conditions in terms of relaxation permanence, the steps of said method comprising, selecting an austenitic stainless steel of the transformation hardening type and containing from 0.01 to 0,20% carbon, up to about 5% silicon, up to about 10% manganese, from 13 to 20% chromium, from 3 to 10% nickel, up to about 25% molybdenum, up to about 25% aluminum and the balance essentially iron; annealing the steel at a temperature of 950°–1100° C. thereby stabilizing the austenite; rapidly quenching the steel from said annealing temperature; cold-working said steel to reduce its cross-sectional area between 40 and 90%, preferably between 60 and 85%; then tempering the steel at a temperature in the range between 200° and 550° C., preferably 250°–450° C. and thereafter cold-working said steel to reduce its cross-sectional area between 5 and 40%.

3,917,493
AUSTENITIC HEAT RESISTING STEEL

Tohru Mimino, Tokyo; Kazuhisa Kinoshita, Yokohama; Takayuki Shinoda, Tokyo, and Isao Minegishi, Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 13, 1973, Ser. No. 387,736
Int. Cl.[2] C21D 7/14; C22C 38/48, 38/50
U.S. Cl. 148—12 E **4 Claims**



1. A method of making austenitic heat resistant steel comprising:

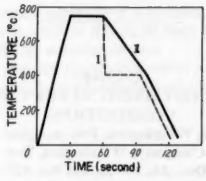
forming a steel mixture of iron and the following ingredients in weight percent proportions:

C—0.03 to 0.30%; Si—0 to 1.00%; Mn—0 to 2.00%; Cr—15.0 to 26.0%; Ni—7.0 to 22%; and each of Nb,Zr,Ti—0.02 to 1.0%; wherein the Nb,Zr,Ti atomic ratio to C is within the range of 0.05 to 1.0; working the mixture into a plate; heat treating the plate above 1050°C for at least 10 minutes; and thereafter water quenching the steel.

3,917,494
CONTINUOUS ANNEALING PROCESS OF STEELS EXHIBITING LOW YIELD POINT RETARDED OF AGING PROPERTIES AND GOOD DRAWABILITY

Haruo Kubotera, 371 Kami-Kurata, Totsuka-ku, Yokohama, Kanagawa; Kazuhide Nakaoka, No. 1030 Yagami, Kawasaki, Kanagawa; Kaoru Watanabe, No. 1497-29, Iikuraya, Shinohara, Kohoku Yokohama, Kanagawa; Akihiko Nishimoto, No. 2412 Kami-Wada, Yamato, Kanagawa, and Nobuo Tanaka, 1-3, 3-Chome, Isegaoka, Fukuyama, Hiroshima, all of Japan

Continuation-in-part of Ser. No. 115,474, Feb. 16, 1971, abandoned. This application Oct. 26, 1973, Ser. No. 410,160
Int. Cl.[2] C21D 9/48
U.S. Cl. 148—12 C **5 Claims**

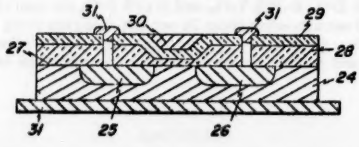


1. In a continuous annealing process for producing steel having a yield strength of less than 23 Kg/mm², a retarded aging property and good drawability, comprising passing a low carbon steel of ≤ 0.06% carbon serially through a heating zone, rapid cooling zone, shelf treating zone and cooling zone, the improvement which includes coiling a hot rolled steel strip at a temperature of more than 630°C. and then quenching the strip from the recrystallization temperature to a temperature between room temperature and 500°C at a rate of more than 50°C/sec in said rapid cooling zone.

3,917,495
METHOD OF MAKING IMPROVED PLANAR DEVICES INCLUDING OXIDE-NITRIDE COMPOSITE LAYER

F. Hubbard Horn, deceased, late of Schenectady, N.Y. (by Helen W. Horn, executrix, Schenectady, N.Y.), assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 42,269, June 1, 1970, abandoned, and a continuation-in-part of Ser. No. 530,811, March 1, 1966, Pat. No. 3,597,267. This application Aug. 16, 1974, Ser. No. 497,856
Int. Cl. H01l 11/00
U.S. Cl. 148—187 **21 Claims**



1. In the process of fabricating a semiconductor device including a monocrystalline wafer of a semiconductor material of a given conductivity type having an active major surface of relatively high resistivity with at least one discrete major surface-adjacent portion thereof of a different conductivity type, with a layer of passivating-insulating material covering said active major surface and the intersection of said different conductivity regions, and having a metallic contact member in electrical contact with said discrete surface-adjacent region and overlying at least a portion of said insulating layer, the improvement including the steps of

a. forming over the active major surface of said semiconductor wafer an insulating-passivating layer of silicon dioxide; and

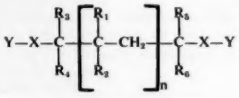
b. depositing over said silicon dioxide an amorphous layer of silicon nitride which is impervious to impurity ions of the alkali metal class at elevated temperatures to protect said silicon dioxide from alkali ion contamination from deposited metallic contacts.

3,917,496
PROPELLANT COMPOSITIONS CONTAINING EPOXY FUNCTIONAL POLYMER HAVING A SATURATED BACKBONE

Toshio William Nakagawa, San Jose, Calif., assignor to United Technologies Corporation, East Hartford, Conn.

Filed Mar. 12, 1971, Ser. No. 123,859
Int. Cl.[2] C06D *5/06*
U.S. Cl. 149—19.6 **7 Claims**

1. A crosslinkable polymer composition comprising a compound having the structure:



wherein R_1 and R_2 are selected from the group consisting of lower alkyl groups containing from 1–10 carbon atoms, R_3, R_4, R_5, and R_6 are selected from the group consisting of hydrogen and lower alkyl groups containing from 1–10 carbon atoms, X is selected from the group consisting of

and

and X_1 is the mirror image of X, Y is selected from the group consisting of saturated cyclic and acyclic groups containing from 2–10 carbon atoms, two of which are included in a nonglycidal epoxy group, and n is an integer from 4–250, and a solid particulate oxidizing agent dispersed therethrough.

3,917,497
METHOD AND APPARATUS FOR FORMING TWO INTERFITTING PREFORMED PARTS BY HEAT FUSION OF SAID PARTS

Charles F. Stickler, 57455 Poppy Road, South Bend, Ind. 46619

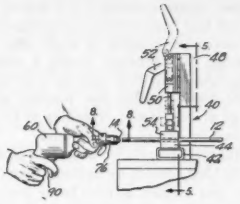
Filed July 20, 1973, Ser. No. 381,254
Int. Cl. B29c *27/08;* **F16i** *47/02;* **B23k** *29/00;* **B28b** *21/22;* **B30b** *3/00*
U.S. Cl. 156—73.5 **12 Claims**

1. The method of making a configured thermoplastic product from two preformed thermoplastic components having respectively an outer surface of substantially uniform circular cross sectional shape and diameter and a bore of substantially uniform circular cross sectional shape and of a diameter to receive said first named component with an interference fit comprising the steps of:

gripping one of said components to restrain it against rotation,

rotating the other component,

advancing one of said components toward the other to selected coaxial telescopic relation therewith while said rotating component rotates at a speed sufficient to generate friction and heat to soften the full extent of the interfitting surface portions of said components, and

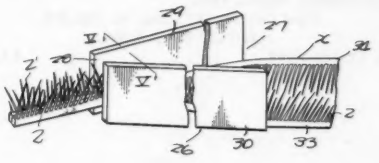


stopping rotation of said rotating component when said selected telescopic relation is reached to accommodate cooling and bonding of said friction heated interfitting surface portions of said components throughout the full extent thereof.

3,917,498
METHOD OF PRODUCING PLASTIC RESIN LAWN-LIKE OBJECTS

Yasuhiro O'Shima, c/o Meiwa Gravure Chemical Co., Ltd. 860, Osaka, Osaka Prefecture, Japan

Filed July 20, 1973, Ser. No. 381,030
Claims priority, application Japan, Aug. 2, 1972, 47-77780
Int. Cl. B29c *5/00*
U.S. Cl. 156—204 **2 Claims**



1. A method for producing artificial grass articles comprising the steps of:

a. forming a molding plate with a mold cavity shaped to have formed therein molded articles including blade portions simulating blades of grass, said molded articles being formed with a pair of spaced apart elongated parallel base members extending on opposite sides thereof each having said blade portions integrally formed therewith and extending therefrom toward each other in opposed directions, each of said blade portions having a length which is less than the distance between said base members, with selected ones only of said blade portions extending from opposite base portions being joined together, said blade portions being formed in a configuration inclined relative to said base members longitudinally thereof;

b. placing string within said mold cavity to extend along portions thereof wherein said base members are formed;

c. filling said mold cavity with synthetic resin paste;

d. hardening said paste within said mold cavity by applying heat thereto thereby to form said molded articles;

e. removing said molded articles from said molding plate and winding said formed molded articles upon a first roller;

f. providing a base sheet wound on a second roller and coating said base sheet on one side thereof with a synthetic resin adhesive while unwinding said base sheet from said second roller;

g. providing a rotating heating cylinder and passing said base sheet in the direction of rotation of said heating

cylinder over the outer peripheral surface thereof so as to dispose said adhesively coated side of said base sheet opposite to said peripheral surface;

h. providing guide means consisting of a pair of side boards and a base, said side boards being juxtaposed to extend in converging directions relative to each other to form a tapering passage therebetween having a wider entrance end and a narrower exit end, said base being connected with said side boards within said passage and having a graded peaked configuration extending in an acute angle from said entrance end to said exit end;

i. unwinding said molded articles from said first roller;

j. folding said molded articles by passing them through said guide means, said molded articles being folded with said base members overlapping and with said blade portions extending from each of said base members on the same side thereof;

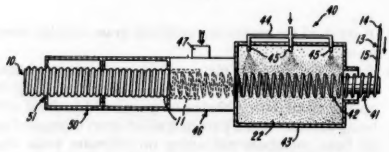
k. passing said base members over said heating cylinder in abutment with said adhesively coated side of said base sheet; and

l. adhering said base members to said base sheet by application of heat from said heating cylinder to harden said adhesive to produce said artificial grass articles with said blade portions extending on one side of said base sheet.

3,917,499
METHOD OF BONDING COMPONENTS MADE OF THERMOPLASTIC MATERIALS

Homer N. Holden, Sylva; Vernon D. Browning, and Bascom D. Blevins, both of Waynesville, all of N.C., assignors to Dayco Corporation, Dayton, Ohio

Filed Oct. 11, 1973, Ser. No. 405,378
Int. Cl.[2] B29D *23/05*
U.S. Cl. 156—144 **5 Claims**

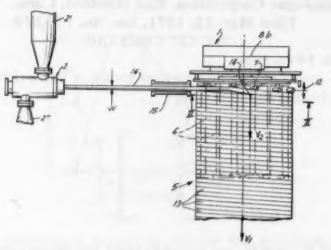


1. A method of making a reinforced flexible conduit comprising the steps of forming a reinforcing member having an outside surface made of a thermoplastic material into a helical pattern, coating the entire outside surface with a liquid plasticizer, providing a tube made of a thermoplastic material, placing a surface of the tube against the coated outside surface, heating at least one of said surfaces to a temperature above ambient temperature, and cooling said surfaces whereby said tube and reinforcing member are fused together by said plasticizer, said coating step comprising introducing said reinforcing member into a chamber having a mist of said liquid plasticizer therein which settles on said outside surface as a coating.

3,917,500
METHOD FOR THE PRODUCTION OF HOLLOW BODIES, ESPECIALLY LARGE-DIAMETER DUCTS FROM THERMOPLASTIC SYNTHETIC RESIN

Aristovoulos George Petzetakis, deceased, late of Moschaton, Piraeous, Greece; Irene H. Diapouli, administrator, 74, Arapaki St., Kallithea, Athens, Greece; Nikolas G. Petzetakis, administrator, 103 Kifissou Ave., Eglaeo, Athens, Greece, and Menelaos G. Petzetakis, administrator, 103 Kifissou Ave., Egaleo, Athens, Greece

Filed June 19, 1973, Ser. No. 371,559
Claims priority, application Greece, June 21, 1972, 048609
Int. Cl.[2] B31C *13/00;* **B29F** *3/00*
U.S. Cl. 156—195 **3 Claims**



1. A method of making a duct omprising the steps of:

extruding a thermally plastic synthetic resin hollow rectangular profile strip having a pair of lateral flanks and a throughgoing passage, the wall thickness at said lateral flanks being less than that of the other walls;

helically coiling said strip and thermally bonding adjacent turns of the coil together at their lateral flanks by applying axial pressure to the turns as they are formed; and

passing a coolant through said strip upon the extrusion thereof and through at least the last two turns formed on said coil to cool the surface of the passage and causing the walls of said passage to become more rigid than the outer surfaces and to be self-supporting against the application of axial pressure, said turns being formed in succession against a previously produced length of duct axially advanced at a speed v_1 and said strip being applied such that the axial pressure applied to bond each turn with the coolant present therein to the previously formed turn results in an axial rate of increase in the length of said duct by a length of v_2; v_1 being smaller than v_2 and the difference $(v_2 - v_1)$ representing the compaction of the strip upon application to the previously formed duct and the axial pressure applied to said strip in bonding same to the previously formed turns.

3,917,501
NON-WOVEN FABRIC-LIKE RUBBERY MATERIAL AND PROCESS OF MANUFACTURE

Lorenzo A. Ferrucci, North Haven, and Whitney J. R. Hauser, Guilford, both of Conn., assignors to Yaleco Industries, Inc., Guilford, Conn.

Filed July 27, 1973, Ser. No. 383,265
Int. Cl.[2] B01D *21/00*
U.S. Cl. 156—279 **7 Claims**

1. A process for producing a non-woven, fabric-like material, comprising:

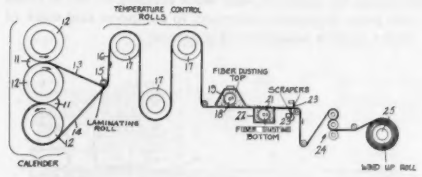
a. forming a uniform blend of uncured natural or synthetic rubber, natural or synthetic powdery fibers having lengths averaging from about 0.004mm. to about 1.5mm., and diameters averaging from about 2 microns to about 40 microns and one or more curing agents;

b. calendering said blend to form a uniform, flexible, substantially non-porous sheet;

c. distributing additional natural or synthetic powdery fibers over at least one surface of said sheet while said sheet is at an elevated temperature so as to adhere said fibers to said surface; and

d. curing said sheet;

the total amount of said fibers being from about 0.5% to about 10% by weight of the material and the blended and added



powdery fibers being effective to impart the feel of fabric to the final sheeted product without substantial loss of elasticity and strength of said rubber.

7. A process as in claim **1** wherein, in step (b), said blend is calendered to form a plurality of plies, and said plies are laminated to form a single said sheet prior to distribution of said powdery fibers thereon.

3,917,502

AUTOMATIC BELT BUILDING APPARATUS

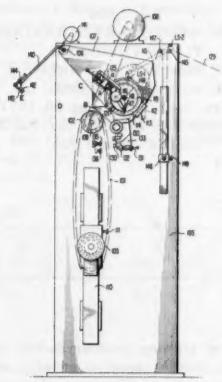
Kaname Shirasaka, Takatsuki; Takashi Tomiyori, Kobe; Nobuo Simizu, Akashi; Iwao Yamashita, and Koithi Nakai, both of Kobe, all of Japan, assignors to Mitsuboshi Belting, Ltd., Kobe, Japan

Filed Jan. 21, 1974, Ser. No. 435,079

Claims priority, application Japan, Jan. 19, 1973, 48-9052

Int. Cl.[2] B26D *5/00;* **B29H** *7/22*

U.S. Cl. 156—353 **13 Claims**



1. An automatic belt building apparatus comprising: a belt storing apparatus for moving laterally outwardly endless belts suspended from hangers one by one, a belt covering machine including a rotatable pulley, a belt feeding apparatus adapted to transfer the extended belts, one by one, onto a convex cylinder and then transfer the same onto said pulley of said belt covering machine, means for rotatably driving said pulley, means for stretching said belt on said pulley, means carried by said covering machine for applying a strip of cover cloth of a predetermined width on said belt laid on the pulley when stretched and for cutting said cloth at predetermined lengths, a detection and removal apparatus for bias joints in the belt cover cloth which detects the bias joints in the cover cloth introduced into said covering machine and leads out said cover cloth by a predetermined length and cuts it for removal of a portion therefrom prior to covering the belt with the remaining cloth on forecasting the approach between the bias joints inherent to the cover cloth and those loop joints of the trailing edges of the cover cloth in covering the belt, means for pressing the cloth onto the belt during rotation of the pulley, a belt detaching apparatus for detaching covered belts from the pulley including means for pushing said covered belts from one side thereof while rotating the pulley and said covered belts running therewith, and a belt accumulation apparatus for hooking up the belts detached from the pulley, said belt accumulation apparatus including a curved lever and means for transferring the same to a predetermined location, and means for operating said apparatus successively and automatically.

3,917,503

APPARATUS FOR PRESSING LAMINATED ASSEMBLIES

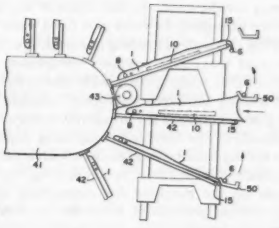
Yuhei Tamura, Tokyo; Osamu Shiozuka, Yokohama; Toshihiko Iwasaki, Tokyo; Yoshio Fujimura, Yokohama, and Kenzo Abe, Tokyo, all of Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Filed Jan. 24, 1974, Ser. No. 436,031

Claims priority, application Japan, Jan. 25, 1973, 48-10541

Int. Cl.[2] B32B *17/00, 31/00*

U.S. Cl. 156—382 **6 Claims**



1. Apparatus for automatically pressing laminated assemblies comprising:

feeding means for automatically inserting said assemblies within bags secured to conveying means;

discharging means for automatically removing said laminated assemblies from said bags secured to said conveying means;

said conveyer means movably supporting a plurality of said bags between said feeding means, where said bags receive said laminated assemblies, and said discharge means, where said laminated assemblies are removed from said bags;

means provided at at least one side of said conveyer for automatically opening and closing said bags;

pressure reducing control means connected to said bags for inparting vacuum conditions within said bags during the time said bags are moved by said conveyer from said feeding means to said discharging means; and

heating means for heating said bags under vacuum conditions during the time said bags are being moved by said conveyer from said feeding means to said discharge means.

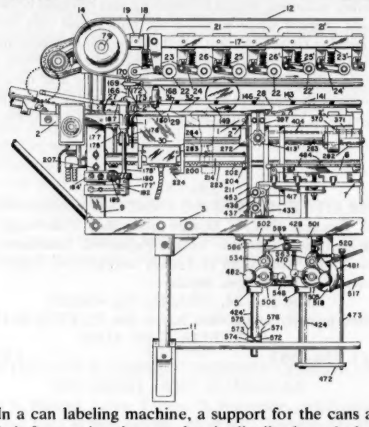
3,917,504
LABELLING MACHINE

Clifford H. Neer, Baltimore, Md., assignor to Matter-Burt Co., Wayne, Pa.

Division of Ser. Nos. 605,279, Dec. 28, 1966, Pat. No. 3,648,823, and Ser. No. 888,092, Dec. 24, 1969, Pat. No. 3,787,267. This application Dec. 3, 1973, Ser. No. 420,979

Int. Cl.[2] B65C *9/04, 3/12*

U.S. Cl. 156—453 **4 Claims**



1. In a can labeling machine, a support for the cans and a feed belt for moving the cans longitudinally through the machine, a portion of said support comprising a comparatively narrow runway for the cans, the side walls of the moving cans on the runway extending beyond and from each side of the runway forming can wall extending portions, means for applying glue to said extending portions comprising a glue pot having gangs of glue feeding discs with means for holding the discs of each gang in fixed assembled relation, means for heating the glue pot, means for adjustably supporting the glue pot longitudinally of the machine comprising depending bearing brackets having bearing engagement with a pair of toothed rack bars vertically adjustable by supporting means at their opposite ends on the machine for supporting the glue pot, longitudinal shields positioned over the toothed rack bars fixedly supported at their opposite ends to the supporting means for the toothed rack bars, each of said shields passing through certain of said bearing brackets without interfering with the longitudinal adjustment of the glue pot and the movement of the supporting brackets for the glue pot, means for moving the glue pot along the pair of toothed rack bars comprising a pair of pinions enmeshed respectively with the rack bars.

3,917,505
APPARATUS FOR STACKING AND CONVEYING SHEET-LIKE SECTIONS

Ehrhart Schulze, Konigsberger Strasse 11, 7012 Fellbach-Schmiden, Germany

Filed Jan. 14, 1974, Ser. No. 432,845

Claims priority, application Germany, Jan. 19, 1973, 2302477

Int. Cl.[2] B32B *31/00*

U.S. Cl. 156—515 **10 Claims**

1. A machine for cutting sheets comprising

a frame;

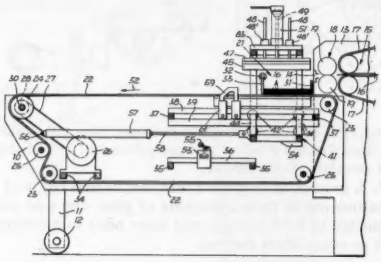
conveying means mounted on said frame for moving a stack of said sheets from a first position to a second position spaced a predetermined longitudinal distance from said first position;

stop means adjacent to said first position for locating on one side of said conveying means a stack of said sheets to be cut;

a movable carriage supported by said frame and arranged to guide said stack longitudinally between said first and second positions;

stack pressing means mounted on said carriage, said stack pressing means including at least two opposed pairs of laterally spaced pressing members, said pairs of pressing members being arranged to span said stack and said conveying means at said first position;

first means for activating said stack pressing means to cause said pairs of pressing members to compress said stack of sheets against said conveying means;



second means to activate said conveying means to advance said compressed stack of sheets from said first position to said second position and

cutting means mounted on said frame so that said cutting means extends into the path of said compressed stack in the space between said first and said second positions for cutting said stack of sheets as said stack is conveyed from said first station to said second station, said cutting means being arranged to pass between said laterally spaced pairs of pressing members.

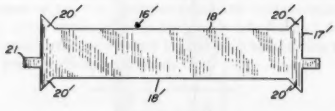
3,917,506
METHOD OF GROWING QUARTZ CRYSTALS AND SEED PLATE THEREFOR

Theodore E. Lind, Stone Park, and Richard J. Burton, Chicago, both of Ill., assignors to Motorola, Inc., Chicago, Ill.

Continuation of Ser. No. 175,986, Aug. 30, 1971, abandoned. This application July 11, 1973, Ser. No. 378,282

Int. Cl.[2] B01J *17/06*

U.S. Cl. 156—621 **12 Claims**



1. A method of growing monocrystalline quartz by the transfer of quartz from an aqueous growing solution onto a crystal seed which comprises the steps of providing an elongated quartz crystal seed plate having its length extending substantially parallel to a crystallographic Y-axis and its thickness extending parallel to the Z-axis, forming said plate to provide a pair of spaced apart integral projections having a generally triangular portion on a side parallel to the crystallographic Y-axis and extending outwardly from said side in the crystallographic -X-direction with one side of the triangular portion forming an obtuse angle with the side, each projection being positioned adjacent an end of said side with said side extending substantially continuously therebetween, and exposing said seed plate under growing conditions at elevated temperature and pressure to an aqueous solution in contact with a supply of silica to affect the transfer of quartz onto the seed bar.

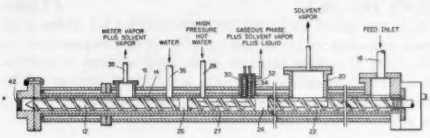
3,917,507
COUNTERCURRENT COMBINED LIQUID AND VAPOR STRIPPING IN SCREW DEVOLATILIZER

Richard H. Skidmore, Strafford, Pa., assignor to Welding Engineers, Incorporated, King of Prussia, Pa.

Continuation-in-part of Ser. No. 117,332, Feb. 22, 1971, Pat. No. 3,799,234. This application Sept. 27, 1973, Ser. No. 401,360

Int. Cl.[2] A21C *1/06;* **A01J** *17/00;* **B01D** *1/28*

U.S. Cl. 159—2 E **9 Claims**



1. In a process for removal of a volatile component from a plastic material, the steps which comprise working said material and component in a downstream direction in a zone of an extruder, a downstream portion of said zone being filled with said material under pressure, maintaining said material at a lower pressure at an upstream portion of said zone, injecting into said plastic material at said downstream portion where said material is in a viscous condition and fully fills the interflight space at the point of injection, a substance which within said zone is a mixture of liquid and gas, causing said liquid and gas to flow as a mixture in countercurrent contact through said viscous plastic material in said zone, and removing said liquid and gas together with said volatile component at said upstream portion of said zone, said plastic material, at a location downstream of said point of injection, being maintained at a higher pressure than the pressure at said injection point.

3,917,508
PROCESS AND APPARATUS FOR RECOVERING CLEAN WATER AND SOLIDS FROM DILUTE AQUEOUS SOLIDS

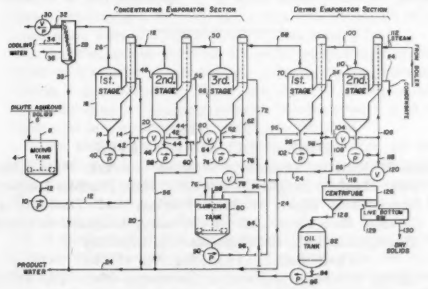
Charles Greenfield, Murray Hill; Robert E. Casparian, Boonton, and Anthony J. Bonanno, Parsippany, all of N.J., assignors to Hanover Research Corporation, East Hanover, N.J.

Division of Ser. No. 406,632, Oct. 15, 1973, Pat. No. 3,898,134, which is a continuation-in-part of Ser. No. 165,070, July 22, 1971. This application Mar. 10, 1975, Ser. No. 556,884

The portion of the term of this patent subsequent to Feb. 13, 1990, has been disclaimed.

Int. Cl.[2] B01D *1/00, 1/26, 3/02, 3/34*

U.S. Cl. 159—47 R **4 Claims**



1. A process for recovering clean water from dilute aqueous solids comprising the steps of (1) concentrating said dilute aqueous solids by heat evaporation to yield concentrated aqueous solids and steam; (2) condensing said steam to recover product water; (3) admixing said concentrated aqueous solids with a relatively non-volatile fluidizing oil to obtain a mixture which will remain fluid and pumpable after the removal of the water content therefrom; (4) subjecting the resultant oil-containing mixture to dehydration by heat evaporation to yield steam and a substantially anhydrous solids in oil slurry, and (5) using said steam from dehydration step (4) as a source of heat in concentration step (1).

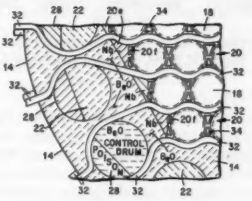
3,917,509
THERMIONIC NUCLEAR REACTOR WITH INTERNAL HEAT DISTRIBUTION AND MULTIPLE DUCT COOLING

Colin R. Fisher, La Jolla, and Louis W. Perry, Jr., Rancho Santa Fe, both of Calif., assignors to The United States of America as represented by The United States Energy Research & Development Administration, Washington, D.C.

Continuation-in-part of Ser. No. 306,483, Nov. 14, 1972, abandoned. This application Apr. 16, 1974, Ser. No. 461,473

Int. Cl.[2] G21C *15/02*

U.S. Cl. 176—39 **1 Claim**



1. In a thermionic nuclear reactor, the combination of:
a core defined by side, top and bottom boundaries and containing fissionable material;
a reflector about said core;
a matrix for said core, said matrix extending generally through said core, substantially from side-to-side and top-to-bottom thereof;
an assembly of generally cylindrical thermionic cells emplaced within said matrix, said cells being disposed side-by-side and each of said cells containing a quantity of fissionable material, the fissionable material within said core aggregating a potentially critical mass;
reactivity control means for said critical mass, disposed in said reflector;
a multiplicity of generally sinusoidal coolant ducts extending through the reactor from side-to-side, through said core and said reflector, each of said ducts being of narrow rectangular cross-section and tracing an undulate path through said core, among and about said cells, a portion of the periphery of each of said cells being disposed in undulations of said ducts in heat conductive relationship therewith; and
a multiplicity of sealed heat pipes, each contained entirely within said core, each heat pipe being enclosed by said matrix in heat conductive relationship to said cells and to said ducts, said heat pipes extending transversely of said coolant ducts and parallel to said cells.

3,917,510
LYSIS OF YEAST CELL WALLS

Kumpei Kitamura; Yasushi Yamamoto; Eiichi Kokubo, and Yoshiro Kuroiwa, all of Takasaki, Japan, assignors to Kirin Beer Kabushiki Kaisha, Kyobashi, Japan

Filed Apr. 8, 1974, Ser. No. 458,954

Claims priority, application Japan, Apr. 11, 1973, 48-40375; Apr. 11, 1973, 48-87864

Int. Cl.[2] C12B *1/00*

U.S. Cl. 195—2 **18 Claims**

1. In a method for lysis of yeast cell walls wherein the yeast is subjected to treatment in an aqueous medium with an enzyme which is capable of lysing yeast cell walls and which is selected from the group consisting of snail enzyme and an

enzyme produced by Arthrobacter luteus thereby to lyse the yeast cell walls, the improvement which comprises effecting the treatment on the yeast cell walls under the influence of a water-soluble sulfite whereby the lysis is accelerated by the water-soluble sulfite, the influence being exerted before or at the time of the treatment by contacting the yeast with an aqueous sulfite in a molar concentration of from 0.01 to 1.0 M.

3,917,511

PROCESS FOR PREPARING L-PHENYLALANINE

Kiyoshi Nakayama, Sagamihara, and Hiroshi Hagino, Tokyo, both of Japan, assignors to Kyowa Hakko Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 163,486, July 16, 1971, Pat. No. 3,759,790. This application Mar. 26, 1973, Ser. No. 345,226

Claims priority, application Japan, July 29, 1970, 45-65755

The portion of the term of this patent subsequent to Sept. 18, 1990, has been disclaimed.

Int. Cl.[2] C12D *13/06*

U.S. Cl. 195—29 **4 Claims**

1. A process for producing L-phenylalanine by fermentation which comprises culturing in a nutrient medium an L-phenylalanine-producing mutant strain of Microbacterium ammoniaphilum having the property of resistance to at least one compound selected from the group consisting of tyrosine, phenylalanine and analogues thereof to produce and accumulate L-phenylalanine in the culture liquor, and thereafter recovering the L-phenylalanine from the culture liquor.

3,917,512

LIMONATE:NAD (P) OXIDOREDUCTASE

Shin Hasegawa, Pasadena; Linda C. Brewster, Carson, and Vincent P. Maier, Newport Beach, all of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Apr. 15, 1974, Ser. No. 461,181

Int. Cl.[2] C12D *13/10*

U.S. Cl. 195—62 **3 Claims**

1. The enzyme limonoate:NAD(P) oxidoreductase having the specific ability of converting limonoate A-ring lactone into 17-dehydrolimonoate A-ring lactone, and which is further characterized as follows:

a. Effect of pH: exhibits maximum activity at pH 8.0, a relative activity of 60% at pH 7, 30% at pH 6, and 14% at pH 5,

b. Cofactor requirement: either NAD or NADP, exhibits approximately twice as much activity with the latter,

c. Stability under acid conditions: retains 90% of its activity when held at pH 3.5, 23° C., for 5 minutes, and 31% when held at pH 3.5, 33° C., for 5 minutes,

d. and exhibits a low affinity for DEAE as compared with limonoate:NAD oxidoreductase.

3,917,513

REMOVAL OF TRANSGLUCOSIDASE FROM AMYLOGLUCOSIDASE

Moshe Sternberg, South Bend, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Dec. 28, 1970, Ser. No. 102,229

Int. Cl.[2] C07G *7/02*

U.S. Cl. 195—66 R **4 Claims**

1. A process for removing transglucosidase from amyloglucosidase solutions which comprises mixing an amyloglucosidase solution containing transglucosidase with a polyacrylic acid at a pH from 3 to 4 to form a precipitate between the transglucosidase and the polyacrylic acid and then separating the precipitate from the amyloglucosidase.

3,917,514

PROCESS FOR PREPARING THE ANTIBIOTIC S 15-1

Akio Mimura; Masahiko Wada; Yoshiyuki Hashimoto; Katsuaki Tsuzuki; Takashi Iguchi; Takeshi Kawamura, and Kei Arima, all of Tokyo, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Oct. 15, 1974, Ser. No. 514,342

Claims priority, application Japan, Oct. 26, 1973, 48-120547

Int. Cl.[2] C12D *9/14*

U.S. Cl. 195—80 R **4 Claims**

1. A process of preparing the antibiotic S 15-1 which comprises culturing *Streptomyces sp.* HW-64 or *Streptomyces sp.* HW-70 in a culture medium containing sources of carbon, nitrogen and inorganic salts until a sufficient amount of the antibiotic has been imparted in the medium and recovering the antibiotic from the medium.

3,917,515

SERUM LIPASE METHOD AND MEDIUM

Jack M. Goldberg, 7335 N. Lavergne, Skokie, Ill. 60076

Filed Mar. 13, 1974, Ser. No. 450,830

Int. Cl.[2] C12K *1/04*; C12K *1/10*

U.S. Cl. 195—103.5 R **30 Claims**

1. A method of measuring pancreatic lipase activity in serum comprising: providing a medium comprising a substantially inert, supporting matrix having a porosity which enables pancreatic lipase to diffuse therein at a rate which is different from the rate at which lipase competing agents in serum will diffuse therein said medium containing a substance capable of being acted upon by the pancreatic lipase and a substance which acts to inhibit the activity of pancreatic lipase competing agents present in serum, introducing into the medium serum containing pancreatic lipase, and allowing the pancreatic lipase and any pancreatic lipase competing agents present in the serum to differentially diffuse in the medium and the pancreatic lipase to act upon said first mentioned substance to provide in the medium measurable indicia of pancreatic lipase activity.

3,917,516

COKE-COOLING APPARATUS

Hans Waldmann, Trostberg; Wilfried Schwarz, Wald Kraiburg; Manfred Bergfeld, Tacherting; Hans Joachim Laupitz, Burghausen; Klaus Müller, Mehring, and Thaddeus J. Oleszko, Burghausen, all of Germany, assignors to Linde Aktiengesellschaft, Hollriegelskreuth, Germany

Filed Mar. 21, 1974, Ser. No. 453,547

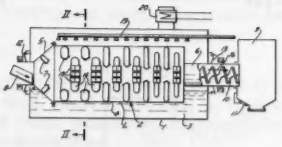
Claims priority, application Germany, Mar. 26, 1973, 2315024

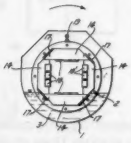
Int. Cl. C10b *39/00*

U.S. Cl. 202—227 **9 Claims**

1. In a coke-cooling apparatus for bulk material comprising a vessel forming a water bath, an elongated drum rotatable about a horizontal axis in said vessel and dipping into said water bath; the improvement comprising a multiplicity of tubular cooling pockets formed on the wall of said drums, said

drum having a sheet-metal wall, the wall thickness of said drum and said cooling pockets increasing progressively from





an intermediate region along the length of said drum toward the opposite ends thereof.

3,917,517
CHROMIUM PLATING ELECTROLYTE AND METHOD

Joseph Thomas Jordan; John Joseph Bernard Ward, both of Wantage, and Clive Barnes, West Hanney, all of England, assignors to International Lead Zinc Research Organization, Inc., New York, N.Y.

Filed Sept. 24, 1974, Ser. No. 508,866
Claims priority, application United Kingdom, Oct. 10, 1973, 47424/73
Int. Cl.[2] C25D *3/06, 3/56*
U.S. Cl. 204—43 P **13 Claims**

1. An electrolyte solution for electrodeposition of chromium on a substrate, said solution comprising hypophosphite ions in a concentration of at least about 0.08 M, trivalent chromium ions in a concentration of at least about 0.5 M, and ammonium ions in a concentration of at least 0.2 M.

3. An electrolyte solution for electrodeposition of chromium on a substrate, said solution comprising hypophosphite ions in a concentration of at least about 0.08 M, trivalent chromium ions in a concentration of at least about 0.5 M, and boric acid in a concentration of at least 0.03 M.

5. An electrolyte solution for electrodeposition of chromium on a substrate, said solution comprising hypophosphite ions in a concentration of at least about 0.08 M, trivalent chromium ions in a concentration of at least about 0.5 M, and containing at least 1% dimethylformamide.

6. A method of electrodepositing a chromium coating on a substrate which comprises immersing said substrate in an electrolyte solution comprising water, hypophosphite ions in a concentration of at least about 0.8 M and trivalent chromium ions in a concentration of at least 0.5 M, maintaining the temperature below about 55°C and passing an electric current through said solution thereby to deposit said trivalent chromium ions on a substrate.

7. A method according to claim **6** for the electrodeposition of chromium-nickel alloys wherein said solution contains nickel ions in a concentration of from about 0.05 M to about 1.0 M.

3,917,518
HYPOCHLORITE PRODUCTION

Charles R. Franks, North Madison; Barry A. Schenker, Mayfield Heights, and James M. Kolb, Mentor, all of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

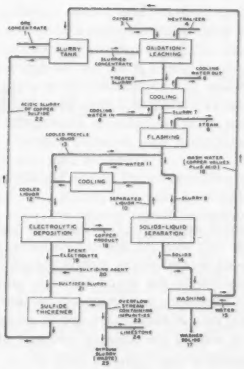
Filed Apr. 19, 1973, Ser. No. 352,419
The portion of the term of this patent subsequent to Feb. 19, 1991, has been disclaimed.
Int. Cl.[2] C25B *1/24*
U.S. Cl. 204—95 **4 Claims**

1. In a process for the production of hypochlorite by the electrolysis of an aqueous alkali metal chloride solution, the improvement that comprises passing an electrolyzing current through said solution between a cathode and an opposed anode, which anode comprises a conductive base bearing on at least a portion of the surface thereof a coating consisting essentially of from 30 to 90 percent by weight stannic oxide, from 1.0 to 10 percent antimony oxide, calculated as Sb_2O_3, from 1.0 to 50 percent of at least one platinum group metal oxide and from 0.5 to 30 percent of a valve metal oxide selected from the group consisting of titanium and tantalum oxides, with the proviso that the mole ratio of SnO_2:Sb_2O_3 is between 95:5 and 85:15.

3,917,519
PROCESS FOR THE MANUFACTURE OF ELECTROLYTIC COPPER

Bernard M. Fisher, New Orleans; Robert C. Hills, Metairie, and Freddie J. Touro, New Orleans, all of La., assignors to Freeport Minerals Company, New York, N.Y.

Filed Feb. 27, 1974, Ser. No. 446,314
Int. Cl. C22d *1/16;* **C22b** *15/00*
U.S. Cl. 204—108 **22 Claims**



1. Process for recovering copper from a copper-bearing sulfide ore containing iron comprising the steps of:

passing an aqueous slurry of said ore through an oxidation-leaching operation in an autoclave system while maintaining the temperature within said autoclave system at between 350°F and 450°F and providing an oxygen partial pressure within said autoclave system of between about 50 and 500 pounds per square inch to form sulfuric acid and to solubilize the metal constituents in said slurry as sulfate solutions,

reducing the acidity of said solutions in said autoclave system by the addition of a neutralizing agent during said oxidation-leaching operation to precipitate substantially all of the solubilized iron in said solutions as insoluble ferric oxide,

withdrawing from said autoclave system the treated slurry comprising a liquid phase of acidic copper sulfate and

solids comprising ore gangue and the precipitated ferric oxide,

flashing the treated slurry to atmospheric pressure,

separating said liquid phase from said solids,

washing said separated solids with an aqueous wash medium to recover retained copper sulfate solution and recycling said recovered copper sulfate solution to said autoclave system,

cooling said separated liquid phase,

electrolytically treating said separated liquid phase to produce electrolytic copper and a spent electrolyte comprising sulfuric acid and a residual amount of copper,

treating said spent electrolyte with a sulfiding agent to precipitate substantially all of said residual amount of copper from said electrolyte as copper sulfide,

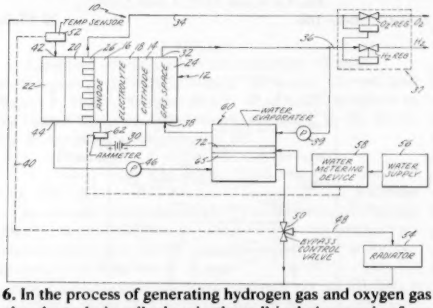
thickening said treated spent electrolyte to separate said precipitated copper sulfide from said treated spent electrolyte as a thickened copper sulfide slurry, and

recycling said thickened copper sulfide slurry to said autoclave system.

3,917,520
ELECTROLYSIS CELL SYSTEM AND PROCESS FOR GENERATING HYDROGEN AND OXYGEN

Murray Katz, Newington; Robert A. Sanderson, Wethersfield, and John H. Hirschenhofer, Glastonbury, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 20, 1974, Ser. No. 525,609
Int. Cl.² C25B 1/02
U.S. Cl. 204—129 **9 Claims**



6. In the process of generating hydrogen gas and oxygen gas in the electrolysis cell wherein the cell includes a pair of gas diffusion electrodes spaced apart, matrix means for retaining an aqueous electrolyte in the space between said electrodes, means forming a hydrogen gas space on the non-electrolyte side of one of said pair of electrodes and an oxygen space on the nonelectrolyte side of the other of said pair of electrodes, and a thermal exchange portion, the steps of:

supplying current to said cell;

recirculating a portion of one of the gases produced by said cell through its respective gas space;

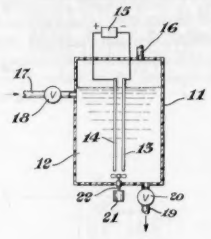
maintaining a temperature gradient across said cell wherein the recirculating gas stream enters said gas space at the high temperature side of said cell and leaves said gas space at the low temperature side of said cell including the step of circulating a liquid coolant through said thermal exchange portion of said cell in a direction counter to the flow of said recirculating gas stream through said gas space;

supplying water to said electrolysis cell at a rate directly proportional to the current supplied to said cell and in an amount equal to the amount used by said cell plus the amount leaving said cell in the non-recirculating product gases, said step of supplying water to said cell including the step of vaporizing into the recirculating gas stream all of the water supplied before the water enters the gas space of the cell.

3,917,521
SULFURLESS ELECTROLYTIC CONCENTRATION OF AQUEOUS SULFURIC ACID SOLUTIONS

E. Colin W. Clarke; Jeffrey F. Gilbert, and David N. Glew, all of Sarnia, Canada, assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 23, 1974, Ser. No. 517,346
Int. Cl.² C02C 5/12
U.S. Cl. 204—149 **13 Claims**



1. A method of concentrating an aqueous solution of sulfuric acid of concentration greater than about 75 percent H_2SO_4 by electrolysis in an electrolytic cell containing at least one platinum anode and at least one platinum cathode, wherein the build-up of elemental sulfur on at least one cathode is prevented, comprising:

providing a sufficient quantity of persulfate ions in the sulfuric acid solution in the region immediately surrounding and communicating with the cathode to prevent the build-up of elemental sulfur thereon during said electrolysis.

3,917,522
UNSATURATED POLYESTER RESIN COMPOSITIONS

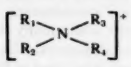
Silvio Vargiu, and Beppino Passalenti, both of Milan, Italy, assignors to Societa Italiana Resine S.I.R. S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 247,182, April 24, 1972, abandoned. This application Nov. 29, 1974, Ser. No. 528,315
Claims priority, application Italy, Apr. 30, 1972, 23912/72
Int. Cl.² C08F 2/50; C08K 5/19; C08L 67/06
U.S. Cl. 204—159.15 **16 Claims**

1. In an unsaturated polyester resin composition which is photochemically curable by exposure to light consisting essentially of:

1. from 30 to 80% by weight based on the total weight of the composition, of an unsaturated polyester resin comprising the condensation product of a polyhydroxy alcohol and a polycarboxylic acid, said condensation reaction being conducted in the presence of a saturated acid having a modifying action, at least one of said polyhydroxy alcohol and said polycarboxylic acid having non-aromatic unsaturation, said unsaturated polyester resin having a viscosity, measured with a Hubbelhode viscosimeter, of between 600 and 1,500 centipoises;
2. from 20% to 70% by weight, based on the total weight of the composition of an inert filler;
3. from 0.2 to 5% by weight, based on the total weight of the composition, of a compound which decomposes upon irradiation with light to initiate the photochemical curing reaction; and
4. from 20% to 70% by weight, based on the total weight of the composition, of an acrylic or vinyl monomer, said monomer reacting with said condensation product upon light irradiation to cure said composition; the improvement consisting essentially of a stable photochemically curable polyester resin composition which consists essentially of, in addition to said unsaturated polyester resin, said inert filler, said decomposible compound and said

monomer, from 0.005 to 1% by weight, based on the weight of said unsaturated polyester resin, of a quaternary ammonium compound represented by the formula:



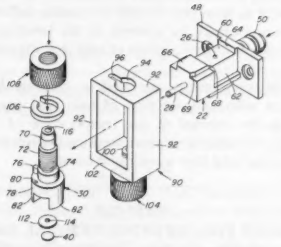
wherein R_1, R_2, R_3 and r_4 each represents alkyl, aryl, including phenol, or aralkyl and wherein X represents halogen.

3,917,523

ELECTROCHEMICAL ELECTRODE STRUCTURE

Bernard Stein, Andover, and Leo M. Patrician, Lexington, both of Mass., assignors to Instrumentation Laboratory, Inc., Lexington, Mass.

Filed Dec. 20, 1973, Ser. No. 426,517
Int. Cl.² G01N 27/28
U.S. Cl. 204—195 F **11 Claims**



1. An electrode system for electrochemical analysis of a sample comprising structure defining a first chamber adapted to contain an electrolyte, structure defining a second chamber adapted to contain the material to be analyzed, each said chamber having a portion defining an opening therein, a flow control member carried by support structure of one of said chamber defining structures and disposed over the opening defining portion of said one chamber defining structure, said flow control member having a multiplicity of passages therethrough, the width of each passage being less than one-half micron such that a multiplicity of ionic junctions are adapted to be provided by said flow control member between electrolyte and the material to be analyzed, said first chamber defining structure including a vent passage extending between the opening defining portion of said first chamber defining structure and an external surface of said first chamber defining structure, said one chamber defining structure further including a guide surface which mates with a cooperating guide surface to establish straight line motion of the opening defining portion of said one chamber defining structure toward the other opening defining portion and alignment of the two chamber openings with said flow control member disposed between said openings while preventing rotation of either opening defining portion relative to the other opening defining portion for providing a controlled liquid flow path for establishing an ionic junction between the electrolyte and the sample material to be measured by the electrode system, and clamp structure for securing surfaces of said opening defining portions in juxtaposed relation while not imposing shear force on the said flow control member interposed between said opening defining portions, said clamp structure including a clamp member arranged to impose clamping force along the axis defined by said aligned openings and a frame member, said clamp member being threadedly received in said frame member and said frame member including interlock structure for receiving and preventing relative rotation of said flow control member and a seal member responsive to said clamp member for sealing said vent passage.

5. A liquid junction flow control component for use in an electrode system for electrochemical analysis comprising

a housing having a flow control member support portion, a reference electrolyte passage having a port at said flow control member support portion, a sealable vent passage extending from said reference electrolyte passage to an external surface of said housing, protecting structure forward of said support portion, a flow control member secured to said support portion and extending across said port, said protecting structure providing protection for said flow control member, guide structure for mating engagement with cooperating guide structure to ensure straight line movement of said flow control member into clamped position without imposing shear force on said flow control member, clamp structure for generating straight line force to seal said flow control member against a cooperating surface defining a port in a sample flow passage, and a seal member disposed over said external surface of said housing arranged to be clamped by said clamp structure to seal said vent passage.

10. In an electrode system for electrochemical analysis of a sample including a liquid junction arrangement of the restricted flow type, the improvement comprising:

a replaceable structure provided with a chamber from a coupling section to a mating surface containing a port and a pair of flanges projecting from said mating surface, a flow control member concentrically secured over said port;

a liquid junction component member having a coupling section, a flange and a central body section provided with a planar surface and a pair of parallel guide surfaces extending from and normal to said planar surface, said component member being also provided with a through passage having a central bend portion communicating with a port formed in said planar surface; and

a clamp structure including a frame having a pair of opposed openings, one of said openings designed to accommodate and secure against rotation said coupling section of said replaceable structure and the other of said openings designed to receive a clamp screw; whereby, said mating surface of said replaceable structure may be securely mated in straight-line motion to said planar surface of said component member so as to position said flow control member between said juxtaposed ports of said structure and said member.

11. In an electrode system for electrochemical analysis of a sample including a liquid junction arrangement of the restricted flow type, the improvement comprising:

a replaceable structure having a body portion provided with a chamber along its longitudinal axis from a coupling section to a mating surface at its other end containing a port and a pair of flanges projecting from said mating surface, a flow control member concentrically secured by an apertured self-adhering member over said port;

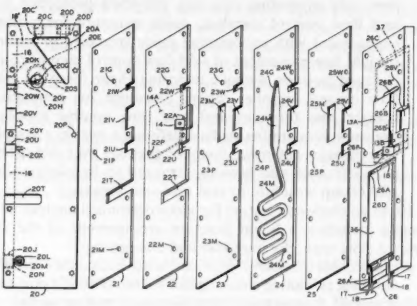
a liquid junction component member having a coupling section at one end, a flange and a central body section provided with a planar surface and a pair of parallel guide surfaces extending from and normal to said planar surface, and a projection at its other end, said component member being also provided with a through passage from its said coupling section to its said projection, said passage having a central bend portion communicating with a port centrally formed in said planar surface; and

a clamp structure including a frame having a pair of opposed openings, one of said openings designed to accommodate and secure against rotation said coupling section of said replaceable structure and the other of said openings designed to receive a clamp screw whereby said mating surface of said replaceable structure may be securely mated in straight-line motion to said planar surface of said component member so as to position said flow control member between said juxtaposed ports of said structure and said member.

3,917,524
ELECTROCHEMICAL CELL ASSEMBLY

James G. Connery, North Wales; George R. Moreland, Green Lane, and Victor S. Underkoffler, Doylestown, all of Pa., assignors to Leeds & Northrup Company, North Wales, Pa.

Filed May 10, 1974, Ser. No. 469,141
Int. Cl.² G01N 27/28, 27/46
U.S. Cl. 204—195 R 3 Claims



1. An electrochemical cell comprising
two electrodes,
a body structure supporting said electrodes in spaced relationship and having wall portions cooperating with said electrodes to define a fluid cavity, said body structure including wall portions defining a passage leading to said cavity for the flow of fluid through said passage into said cavity,
first heating means disposed in intimate heat transfer relation with at least one of said electrodes defining said cavity for control of the temperature of that electrode and the contents of said cavity, and
second heating means disposed in intimate heat transfer relation with at least one of said wall portions of said passage for control of the temperature of fluid in said passage to maintain a predetermined temperature in fluid flowing to said cavity.

2. An electrochemical cell comprising
a body structure formed by a stacked array of elements secured together in fluid-tight relationship and including two electrodes supported in spaced relationship to form with wall portions of said body a fluid cavity, said body structure including
a first element having a recess which in cooperation with a closure provided by a second element provides another cavity for containment of a salt bridge liquid, said first element additionally including a recess containing a porous material which in cooperation with said second element is secured in fluid-tight relation in said recess,
a reference electrode positioned in said other cavity,
a passage in said first element to convey a salt bridge liquid from said other cavity to a surface of said porous material, and
means to convey fluid from said first mentioned cavity to said porous material in a manner to establish electrical connection between said fluid and said reference electrode disposed in said other cavity by way of a path through said porous material and said salt bridge liquid.

3. An electrochemical cell comprising:
two electrodes having plane surfaces;
a body structure formed by a stacked array of elements secured together in fluid-tight relationship and arranged to support said electrodes in face-to-face relationship, said body structure including;
wall portions cooperating with said electrodes to define a fluid cavity,
other wall portions defining a passage leading to said cavity for flow of fluid through said passage into said cavity,
a first element having a recess, a second element cooperating with said recess to provide a closure for said recess to form another cavity for containment of a salt bridge liquid, said first element additionally including another recess containing a porous material which in cooperation with said second element is secured in fluid-tight relation in said other recess,
a reference electrode positioned in said other cavity,
another passage in said first element to convey a salt bridge liquid from said other cavity to a surface of said porous material, and
means to convey fluid from said first mentioned cavity to said porous material in a manner to establish electrical connection between any fluid passing through said first mentioned cavity and said reference electrode disposed in said other cavity, said connection being by way of a path through said porous material and said salt bridge liquid;
first heating means disposed in intimate heat transfer relation with at least one of said electrodes defining said first mentioned cavity for control of the temperature of that electrode and the contents of said first mentioned cavity; and
second heating means disposed in intimate heat transfer relation with at least part of said wall portion of said passage for control of the temperature of fluid in said passage to maintain a predetermined temperature in fluid flowing to said first mentioned cavity.

3,917,525
ELECTRODE FOR ELECTROCHEMICAL REACTIONS

Pierre Bouy, Enghien-les-Bains, and Guy Cheradame, Pont-de-Claix, both of France, assignors to Rhone-Progil, Courbevoie, France

Filed July 5, 1974, Ser. No. 486,051
Claims priority, application France, July 20, 1973, 73.26694
Int. Cl.² C25B 11/08, 11/10
U.S. Cl. 204—290 F 5 Claims

1. An electrode for electrochemical reactions, comprising a substrate covered with a compound having a perovskite structure, characterized by the fact that the substrate is of a film forming metal and the compound of perovskite structure is a cobaltite of rare earths having the general formula $_{Ln_x}Ln'_{(1-x)}CoO_3$ in which Ln has an atomic number of at least about 65 and Ln' has an atomic number below about 65, wherein x is between 0.001 and 0.999.

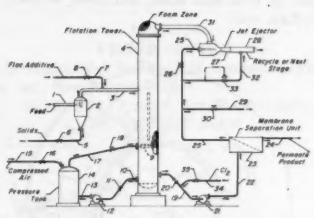
3,917,526
COMBINED FOAM FLOTATION AND MEMBRANE SEPARATION PROCESSING

James L. Jennings, Poway, Calif., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Apr. 4, 1974, Ser. No. 458,165
Int. Cl.² B01D 31/00, 13/00
U.S. Cl. 210—23 7 Claims

1. In a pressurized membrane separation processing operation were the feed stream has entrained, non-soluble material which is at least partially removable by a foam flotation procedure, the improved multi-stage separation operation which comprises, passing the feed stream to a flotation separation stage and therein effecting the aerating and foam lifting of at least a portion of such entrained material to separate it from passage to a subsequent membrane separation stage, withdrawing liquid feed from below the upper foam containing zone of the flotation stage and passing such feed to pressurizing means and then to a membrane separation stage for contact with a membrane at an elevated pressure above 30 psi to effect a desired product separation, discharging and collecting the desired permeate from said membrane separation stage, additionally discharging the elevated pressure concen-

trate stream from the latter stage and passing at least a portion thereof through a jet pumping ejector means which has the low pressure throat zone thereof in open communication with



the upper foam containing zone of said flotation stage, whereby foam and aerated entrained material therefrom will be withdrawn from such stage and discharged with the concentrate passing through the ejector means.

3,917,527

HYDROPHOBIC CHROMATOGRAPHY

Shmuel Shaltiel, Rehovot, Israel, assignor to Yeda Research & Development Co., Ltd., Rehovot, Israel

Filed May 14, 1973, Ser. No. 360,303

Claims priority, application Germany, Apr. 17, 1973, 2319495

Int. Cl.² B01D *15/08*

U.S. Cl. 210—31 C **20 Claims**

1. In a method of selectively and reversibly binding biomolecules to an adsorbent in a chromatographic column by contact therewith, the improvement which comprises employing as the adsorbent a water-insoluble carrier having an arm attached thereto of the formula A—B—C—D, where A is the water-insoluble carrier, B—C—D represents the arm and individually B is a covalent linking group, C is a hydrocarbon group and D is a terminal group selected from the group consisting of hydrogen, ionic radicals and non-ionic radicals; provided that when said biomolecule is a lipophilic protein, B, C and D are other than a combination of —NH—, decyl, and amino or N—(3-carboxypropionyl) amino, respectively.

3,917,528

FORAMINOUS COMPOSITION FOR REMOVAL OF OLEOPHILIC MATERIAL FROM THE SURFACE OF WATER

Julius Orban, Covina, Calif., and Charles E. Case, Summit, N.J., assignors to Sorbent Sciences Corporation, Covina, Calif.

Filed May 29, 1973, Ser. No. 364,777

Int. Cl.² C02B *9/02*

U.S. Cl. 210—36 **10 Claims**

4. A composition comprising a solid foraminous substrate capable of sorbing oleophilic liquids, said substrate impregnated with a drying oil in an amount between 5 and 20 percent by weight, said drying oil being selected from the group consisting of castor oil, grape seed oil, hemp oil, raw linseed oil, refined linseed oil, Oiticica oil, perilla oil, poppy-seed oil, rapeseed oil, safflower oil, raw soybean oil, refined soybean oil, sunflower oil, tobacco seed oil, tung oil, herring oil, menhaden oil, sardine oil, raw tall oil and refined tall oil wherein the foraminous substrate is impregnated with a composition comprising the following agents in the amounts set forth below:

	Weight %
Halogenated Liquid Hydrocarbon	5 to 40
Silicone	1 to 10
Drying Oil	5 to 40

7. A process for removing a liquid oleophilic material from a body of water according to claim 5 wherein the foraminous oleophilic sorbent substrate is impregnated with a composition comprising the following agents in the amounts set forth below:

	Weight %
Halogenated Liquid Hydrocarbon	5 to 40
Silicone	1 to 40
Drying Oil	5 to 40

3,917,529

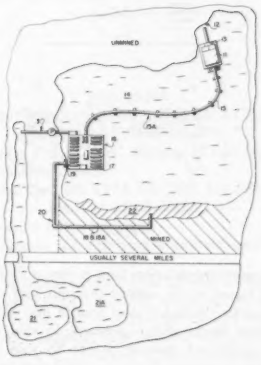
PROCESS FOR THE DESTABILIZATION AND SEPARATION OF ILMENITE ($FeO\ TiO_2$) TAILINGS

Jim M. Madole, Salt Lake City, Utah, and Richard F. Ables, Starke, Fla., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed July 1, 1974, Ser. No. 484,955

Int. Cl.² B01D *21/01*

U.S. Cl. 210—54 **3 Claims**



1. In a process for the recovery of ilmenite from ancient beach sands by dredge ground level mining wherein the sands are classified in a wet mill to produce an ilmenite concentrate and a tailings stream, said tailings stream consisting of a dispersion of water, colloidal humate and silica the improvement comprising adding to said tailings stream dispersion with an effective amount of high speed agitation a water-soluble polymeric cationic amine of molecular weight of about 20,000 to 100,000 in an effective amount of about 6–400 ppm to cause the flocculation of said humate and retention in the tailings.

3,917,530

METHOD TO COUNTERACT A CLOGGING OF DRAIN PIPES

Johann Boske, 2849 Goldenstedt, Arkeburg, Germany

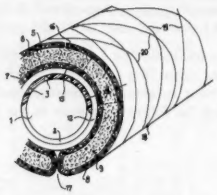
Continuation of Ser. No. 277,470, Aug. 2, 1972, abandoned. This application July 15, 1974, Ser. No. 488,461

Int. Cl.² C02B *5/06*

U.S. Cl. 210—58 **7 Claims**

1. A method of preventing the clogging of nonmetallic underground drain pipes which have porous walls enveloped

by filter material wherein local ground water is drained by radial inflow through said walls comprising,

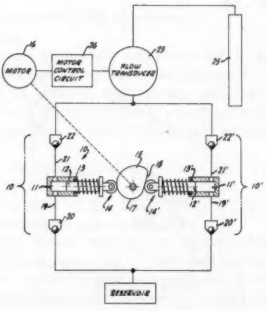


introducing tannin reagent into the pores of said walls to prevent formation of ochre therein.

3,917,531
FLOW RATE FEEDBACK CONTROL CHROMATOGRAPH

Haakon T. Magnussen, Pinole, Calif., assignor to Spectra-Physics, Inc., Mountain View, Calif.

Filed Feb. 11, 1974, Ser. No. 441,371
Int. Cl.[2] B01D *15/08*
U.S. Cl. 210—101 **16 Claims**



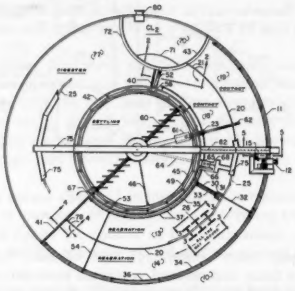
1. In chromatograph apparatus, a chromatograph column, a source of liquid to be passed through said column, pump means connected between said source and said column for delivering said liquid under pressure to said column, drive means for delivering motive power to said pump means, means for detecting flow through said pump and for developing a flow feedback signal in proportion thereto, control means for varying the output of said drive means, said control means including means responsive to said flow feedback signal, and means for comparing said flow feedback signal with a signal representing a predetermined demand value of flow.

3,917,532
SEWAGE TREATMENT PLANT

Donald A. King, Thomasville, Ga., assignor to Davis Water & Waste Industries, Inc., Thomasville, Ga.

Filed Apr. 11, 1974, Ser. No. 460,200
Int. Cl.[2] C02B *3/04;* **C02C** *1/12*
U.S. Cl. 210—199 **10 Claims**

1. A sewage treatment plant comprising:
a. an outer curved wall and an inner curved settling tank wall defining an aeration section therebetween, said walls having a common center,
b. means for facilitating increased sewage capacity of said plant while providing adequate mixing of sewage by air injected into the sewage, said means including (i) a curved intermediate wall located between said inner and outer walls in said aeration section, said intermediate wall having a common center with said inner and outer walls and having inner and outer surfaces thereof facing, respectively, said inner and outer walls, (ii) air diffuser means for providing rolling of sewage in said aeration section, from the intermediate wall toward the outer wall and from the intermediate wall toward the inner wall, said air diffuser means including a plurality of air diffusers mounted on both said inner and outer surfaces of said intermediate wall,

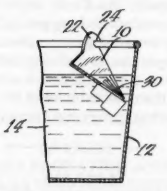


c. generally radially extending wall means for terminating the ends of the intermediate wall, and
d. means for providing limited sewage communication between the areas defined by said intermediate wall and said outer wall and said intermediate wall and said inner wall for preventing shortcircuiting of sewage from a plant influent to a settling tank influent.

3,917,533
ICE GUARD

Michael Macaluso, Jr., 222 Chili Ave., Rochester, N.Y. 14611

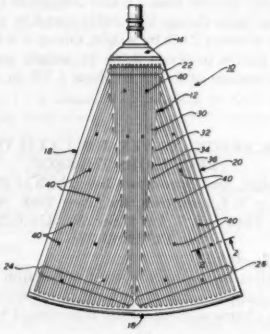
Filed Sept. 10, 1973, Ser. No. 395,988
Int. Cl.[2] B01D *35/02*
U.S. Cl. 210—469 **5 Claims**



1. A protecting device for an open top container containing a drink in which solids are floating, said device comprising a flat integral sheet of thin flexible material having memory for its flat condition including a body portion having a convex edge and a concave edge extending the length of said body portion, a projection extending laterally from each end of said body portion and lying in substantially the same plane with said body portion, said body portion having a plurality of openings through said body portion and lying substantially in the midportion of said body portion, slot means extending from the edges of said body portion to intersect with said openings, a port between each of said projections and said ends of said body portion, said ports being of substantial size for receiving the bead of a lip of the container, a cut forming an elongate entry channel into each port, each channel being defined by a pair of sides having one portion thereof being narrower than said port and forming an opening between the projection and the body portion and said channel having another portion thereof with said sides touching each other

when the device is unassembled with the container, whereby said device may be mounted on the bead on the lip of the container by threading the lip of the container into the entry channels between the projections and the body portion until the bead on the lip of the container nests in said ports with the body portion extending down into the container.

3,917,534
FILTER SECTOR
Richard D. Moore, New Boston, N.H., assignor to Plastic Techniques, Inc., New Boston, N.H.
Filed Apr. 17, 1974, Ser. No. 461,660
Int. Cl.[2] B01D *39/00*
U.S. Cl. 210—486 3 Claims



1. An improved filter sector, said filter sector being of generally fan-shaped configuration and including a pair of generally opposed and parallel sides, a neck at one end thereof and a generally arcuate end at the opposite end thereof, and a pair of generally radially disposed edges, said sides for having a fluid flow pattern therealong extending from said generally arcuate end toward said neck, the improvement comprising:

a pair of generally fan-shaped and generally opposed parallel layers of predetermined molded plastic material providing said sides;

a plurality of through-posts of said predetermined plastic material extending between and molded integrally with said pair of layers of predetermined material and for providing said filter sector with increased structural rigidity;

said through-posts being of generally cylindrical configuration and tapering inwardly from said layers and including an integrally molded central wall of said predetermined plastic material extending parallel to said layers and separating said generally opposed and parallel sides having said grooves formed thereon;

means on the outer surface of each of said sides providing a plurality of parallel neck grooves extending linearly from said generally arcuate end to said neck of said sector;

means on the outer surface of each of said sides providing two pluralities of parallel diagonal grooves, each of said plurality of diagonal grooves disposed on one side of said plurality of neck grooves and each of said plurality of parallel diagonal grooves extending linearly and parallel to one of said generally radially disposed edges; and

each of said neck grooves interconnecting with a predetermined number of said diagonal grooves of one of said pluralities of diagonal grooves to provide an improved fluid flow pattern along said sides extending from said generally arcuate end toward said neck.

3,917,535
AQUEOUS BASED EMULSION FOR TREATING SUBTERRANEAN FORMATIONS
Curtis W. Crowe, Tulsa, Okla., assignor to The Dow Chemical Company, Midland, Mich.
Filed Jan. 12, 1973, Ser. No. 323,969
Int. Cl.[2] E21B *43/28*
U.S. Cl. 252—8.55 C 7 Claims

1. A method of fracturing a subterranean geologic formation which comprises:

injecting a sufficient quantity of an aqueous acid based emulsion into the formation to fracture said formation, said aqueous acid based emulsion comprising as the external phase an aqueous acid solution in which at least a portion of the formation is soluble, as the internal phase from about 20 to about 50 per cent by volume of an organic liquid having a viscosity of from about 5 to about 10,000 centipoise at a temperature of about 75°F and containing less than about 20 per cent by weight of aromatics, and a water-wetting surfactant.

4. A method of increasing the permeability of a subterranean geologic formation which comprises:

contacting said formation with an emulsion comprising an organic liquid, a water-wetting surfactant, and an aqueous acid solution which is reactive with said formation to dissolve away a portion of said formation, said aqueous acid solution comprising the external phase, and said organic liquid has a viscosity ranging from about 5 to about 10,000 centipoise, contains less than about 20 per ccent by weight of aromatics and comprises from about 20 to about 50 per cent by volume of the emulsion.

3,917,536
COMPOSITION AND METHOD FOR ACIDIZING EARTHEN FORMATIONS
Curtis W. Crowe, Tulsa, Okla., assignor to The Dow Chemical Company, Midland, Mich.
Filed Dec. 18, 1972, Ser. No. 316,421
Int. Cl.[2] E21B *43/28*
U.S. Cl. 252—8.55 C 20 Claims

1. A composition for acidizing a subterranean formation which comprises:

an aqueous acidizing acid solution for said formation and an effective amount of a cationic surfactant in said solution to reduce the normal reaction rate of said acidizing solution on said formation, said cationic surfactant consisting of a alkyl C_8 to C_{18} primary amine characterized as rendering the formation surface oil-wet.

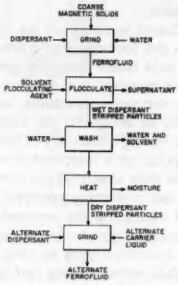
3,917,537
PENETRATING OIL COMPOSITIONS
Austin A. Elsdon, Rte. 2, Box 41, Calvert City, Ky. 42029
Filed Apr. 22, 1974, Ser. No. 462,765
Int. Cl.[2] C10M *1/20, 3/14, 5/12, 7/6*
U.S. Cl. 252—11 5 Claims

1. As a new penetrating oil composition of matter, a mixture consisting essentially of, (a) about 1.5 to 2.5 parts by volume of a mineral lubricating oil, (b) about 1.5 to 2.5 parts bé volume of a polyalkylene glycol or ether component selected from the group consisting of polyalkylene glycol, polyalkylene glycerol, monoether derivatives of said glycols or glycerols, and mixtures thereof, the alkyl groups therein containing 1 to about 7 carbon atoms, said polyalkylene glycol or ether component having a Saybolt viscosity at 100°F. of about 60–600 seconds; (c) about 0.5 to 1.5 parts by volume of gasoline and, (d) about 0.5 to 1.5 parts by volume of a monohydric alcohol of the formula ROH, wherein R is 1 to 7 carbon atoms.

3,917,538
FERROFLUID COMPOSITIONS AND PROCESS OF MAKING SAME

Ronald E. Rosensweig, Summit, N.J., assignor to Ferrofluidics Corporation, Burlington, Mass.

Filed Jan. 17, 1973, Ser. No. 324,414
Int. Cl.[2] H01F *1/25, 1/00;* **C10M** *3/00;* **C09D** *11/00*
U.S. Cl. 252—62.51 **32 Claims**



1. A process for preparing an improved ferrofluid composition, which process comprises in combination:

a. preparing a first ferrofluid composition comprising a dispersion of colloidal-size magnetic particles in a dispersant in a polar liquid carrier;

b. adding a flocculating agent to the first ferrofluid composition to precipitate the magnetic particles from the first composition separating the precipitate from the supernatant liquid to obtain flocked precipitated magnetic particles which are characterized in that such flocked particles will not redisperse in the polar liquid carrier without the addition of a dispersant;

c. recovering essentially dispersant-free magnetic precipitated particles;

d. coating the surface of the flocculated precipitated magnetic particles with a second dispersant; and

e. redispersing said coated particles in a second carrier liquid to provide a second ferrofluid composition of improved properties and characteristics.

3,917,539
METHOD FOR PRODUCING LASER GLASSES HAVING HIGH RESISTANCE TO INTERNAL DAMAGE AND THE PRODUCT PRODUCED THEREBY

Emil W. Deeg, Woodstock, Conn., and Elias Snitzer, Wellesley, Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Aug. 13, 1970, Ser. No. 63,593
The portion of ther term of this patent subsequent to Feb. 4, 1989 has been disclaimed.
Int. Cl.[2] C09K *11/08*
U.S. Cl. 252—301.4 R **5 Claims**

1. The method of producing laser glass having high resistance to internal damage and a loss coefficient of less than 0.5%/centimeter, the glass being prepared using ceramic utensils and comprising the steps of:

preheating the ceramic utensils in an oxygen atmosphere for a period of at least 3 days at a temperature of at least 1000°C so as to render all surfaces of the utensils which contact the glass during melting free of reducing components;

placing laser-glass-forming batch constituents in the ceramic utensils for melting;

melting the batch in the utensils while maintaining an oxidizing condition throughout the batch and over the laser-glass-batch-contacting-utensil surfaces, and

recovering laser glass resistant to internal damage and having a loss coefficient of less than 0.5%/centimeter.

3,917,540
CATALYST FOR HYDROGENATION AND DEHYDROGENATION OF HYDROCARBONS

Ernest L. Pollitzer, Skokie, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 30,990, April 22, 1970, abandoned, which is a division of Ser. No. 814,174, April 7, 1969, Pat. No. 3,529,029, which is a continuation-in-part of Ser. No. 723,886, April 24, 1968, abandoned. This application July 19, 1974, Ser. No. 490,172
Int. Cl.[2] B01J *23/62*
U.S. Cl. 252—466 PT **3 Claims**

1. A non-acid-acting catalytic composite of alumina carrier, a Group VIII noble metal, an alkalinous metal selected from the group consisting of lithium, sodium, potassium, rubidium, cesium, beryllium, magnesium, calcium, strontium, barium and mixtures thereof, and a Group VII-B metal having an atomic number greater than 25, said composite containing on an elemental basis Group VIII noble metal in an amount of from 0.01% to about 2.0% by weight, Group VII-B metal in an amount of 0.01% to about 2.0% by weight and alkalinous metal in an amount of 0.01% to about 1.5% by weight.

3,917,541
HYDROCARBON CONVERSION CATALYSTS AND PRECURSORS THEREOF

Alan C. Wright, and Hsien-Dao Chang, both of Houston, Tex., assignors to N L Industries, Inc., New York, N.Y.

Filed Jan. 7, 1974, Ser. No. 431,028
Int. Cl.[2] B01J *27/12*
U.S. Cl. 252—441 **8 Claims**

1. A catalyst having hydrocarbon conversion activity consisting essentially of a calcined precursor synthetic septechlorite having a chemical composition represented by the following:

$$(6\text{-}x)\ A^{2+}O \cdot x\ L_2{}^{3+}O_3 \cdot (4\text{-}x)\ SiO_2 \cdot y\ HF$$

wherein:

A is Ni, Mg, Co, Fe^{2+}, Cu^{2+}, Mn^{2+}, Zn, or mixtures thereof:
L is Al, Cr, Fe^{3+}, or mixtures thereof:
$0 \quad x \quad 2$
$0 \quad y \quad 1$
$x+y \quad 0.1$
$0 \quad Co \quad 5.75$
$0 \quad Fe^{2+} \quad 2.25$
$0 \quad Zn \quad 4$
$4 \quad (Ni + Mg + Co + Fe^{2+} + Cu + Mn + Zn) \quad 6$
$Cu \quad 0.5$
$Mn \quad 0.5$
$(Cr + Ni + Co + Cu + Mn) > 0.1$
$Fe^{3+} \quad 1,$

said precursor septechlorite prior to calcining being a 1:1 trioctahedral phyllosilicate having equal degrees of trivalent ion substitution in both octahedral and tetrahedral layers, and thus having a balanced framework with no exchangeable ions needed for neutrality.

3,917,542
CATALYST FOR THE PRODUCTION OF PYRIDINE AND 3-METHYLPYRIDINE

Helmut Beschke; Axel Kleemann, and Gerd Schreyer, all of Grossauheim, Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler, Germany

Filed Aug. 8, 1973, Ser. No. 386,570
Claims priority, application Germany, Aug. 12, 1972, 2239801
Int. Cl.[2] B01J *27/12*
U.S. Cl. 252—442 **15 Claims**

1. A catalyst suitable for the reaction of acrolein with ammonia to form pyridine and 3-methylpyridine, said catalyst having been prepared by heating at 600° to 800°C. in the presence of gaseous oxygen (1) aluminum metal, aluminum oxide or a compound of aluminum convertible to the oxide upon heating with gaseous oxygen at 600° to 800°C., (2)

ammonium fluoride, hydrogen fluoride or a fluoride of an element of the second main group of the periodic system and (3) at least one element of the second main group of the periodic system, the oxide of said element or a compound of said element convertible to the oxide in the presence of gaseous oxygen at a temperature of 60° to 800°C., said catalyst consisting essentially of the elements Al, F, O and the element of the second main group of the periodic system.

3,917,543
METHOD FOR PREPARING ZEOLITE-BASED CATALYST COMPOSITION

Anthony P. Bolton, Bardonia; Donald F. Best, Mahipac, and Herbert C. Shaw, Spring Valley, all of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Feb. 16, 1972, Ser. No. 226,932
Int. Cl.² B01J *29/06*
U.S. Cl. 252—455 Z **1 Claim**

1. Process for preparing a conversion catalyst which comprises:

a. providing a zeolite Y molecular sieve having a SiO_2/Al_2O_3 molar ratio of at least 4.0, an alkali metal cation content of from 10 to about 30 equivalent percent and complementarily from about 90 to about 70 equivalent percent non-metallic cations;

b. heating said molecular sieve at a temperature of from 350°C. to below the crystalline destruction temperature for a period of at least 0.1 hr., said heating within the said temperature range being the first such heating to which the molecular sieve in its present cation form has been subjected;

c. cooling the molecular sieve to less than 300°C. and contacting same with an aqueous ammonium ion solution to reduce the alkali metal cation content by ion exchange to less than 10 equivalent percent alkali metal cations, the pH of the said ammonium ion solution in contact with said molecular sieve being in the range of 4 to 8;

d. thereafter forming a composition by intimately admixing the resulting molecular sieve product with finely divided alumina, an alkali metal-free water soluble salt of at least one non-noble metal of Group VIII of the Periodic System, at least one water soluble alkali metal-free compound of a metal of Group VI-B of the Periodic System and water, said Group VI-B metal being present in an amount of from 10 to 30 weight percent calculated as the metal oxide based on the total weight of Al_2O_3 plus zeolite present (solids basis), said Group VIII metal being present in an amount of from 2 to 10 weight percent calculated as the metal oxide based on the total weight of Al_2O_3 plus zeolite present (solids basis), and said water being present in an amount sufficient to render said composition a thixotropic extrudable mass; and

e. extruding the composition thus formed and at least partially dehydrating the extrudate.

3,917,544
AGGLOMERATED ADSORBENT PRODUCTS OF MOLECULAR SIEVE GRAINS

Max Michel, Sarcelles-des-Rosiers, France, assignor to Rhone-Progil, Courbevoie, France

Continuation-in-part of Ser. No. 274,481, July 24, 1972, which is a continuation of Ser. No. 560,059, June 24, 1966, abandoned. This application Oct. 4, 1973, Ser. No. 403,668
Claims priority, application France, June 29, 1965, 65.22737
Int. Cl.² B01J *29/06*
U.S. Cl. 252—455 Z **2 Claims**

1. An adsorbent agglomerate consisting essentially of molecular sieve grains and an inorganic binder of alumina prepared by partially dehydrating an alumina hydrate in a current of hot gas at a temperature within the range of 400 to 1000°C for a time ranging from a fraction of a second up to 10 seconds, with the partially dehydrated alumina being aged in the presence of water and in the presence of the molecular sieve grains and with the resulting aged alumina being activated while in contact with the molecular sieve grains by calcination to form the agglomerates.

3,917,545
PHOTODEGRADABLE STYRENE POLYMER FOAMS CONTAINING A HYDROCARBON PHOTOSENSITIZER

Harold A. Wright, Murrysville, Pa., assignor to Arco Polymers, Inc., Philadelphia, Pa.

Filed Apr. 5, 1973, Ser. No. 348,179
The portion of the term of this patent subsequent to Aug. 27, 1991, has been disclaimed.
Int. Cl.² C08J *9/16*
U.S. Cl. 260—2.5 HB **6 Claims**

1. A process for making expandable styrene polymer particles containing a photosensitizer comprising suspending styrene polymer particles with the aid of a suspending system in water containing from 3 to 20 per cent by weight of a blowing agent and a photosensitizer, heating the suspension at a temperature of from 80° to 150°C. to impregnate the polymer particles, and separating the impregnated particles from the water; said photosensitizer being present in an amount of 0.5–5.0 parts per 100 parts of said polymer particles and being selected from the polynuclear hydrocarbons having at least one benzylic methylene group in one of the rings.

3,917,546
CHLORAL COPOLYMERS

Otto F. Vogl, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Division of Ser. No. 227,684, Feb. 18, 1972, Pat. No. 3,775,371, which is a division of Ser. No. 886,739, Dec. 19, 1969, Pat. No. 3,668,184, which is a continuation-in-part of Ser. No. 731,622, May 23, 1968, abandoned, which is a continuation-in-part of Ser. No. 580,217, Sept. 19, 1966, abandoned, which is a continuation-in-part of Ser. No. 558,631, June 20, 1966, abandoned. This application Apr. 18, 1973, Ser. No. 352,387
Int. Cl.² C08J *9/00;* **C08G** *6/00, 2/18*
U.S. Cl. 260—2.5 F **31 Claims**

1. An addition copolymer of chloral and at least one comonomer of the formula $R^1R^2C{=}C{=}O$, the copolymer containing from 1 to 99.9 mol percent of chloral, in which

R^1 & R^2, alike or different and separately and jointly, are selected from the group consisting of

1. monovalent groups selected from the group consisting of hydrogen, cyano, lower alkoxycarbonyl, and unsubstituted and substituted hydrocarbyl and hydrocarbyloxy in which any hydrocarbyl moiety is of 1–18 carbon atoms selected from the group consisting of alkyl, cycloalkyl, aryl, aralkyl and alkaryl, and any substituent is selected from the group consisting of lower alkoxy, fluorine, chlorine, bromine, and ioidine; and
2. divalent groups selected from alkylene of 2 to 7 carbons.

9. A copolymer of claim 8 in which the filler is fiber glass.

3,917,547
ORGANIC-INORGANIC FOAMED FOAM

David H. Massey, Glencoe, Ill., assignor to Phoenix Corporation, St. Paul, Minn.

Filed Jan. 14, 1974, Ser. No. 433,146
Int. Cl.² C08G *18/14;* **C08J** *9/32;* **C08K** *7/28*
U.S. Cl. 260—2.5 AK **2 Claims**

1. A composition of matter comprising a flexible polyurethane foam having improved compression strength produced by incorporation of cenospheres from flyash into a polyurethane foam forming composition.

3,917,548

PROCESS FOR THE SUSPENSION POLYMERIZATION OF POLYVINYL CHLORIDE

Charles L. Harrington, Newark, Del., assignor to Stauffer Chemical Company, New York, N.Y.

Filed Dec. 14, 1970, Ser. No. 98,076
Int. Cl. C08f *15/02, 15/30, 3/30*
U.S. Cl. 260—17 A 4 Claims

1. A polymer selected from the group consisting of polyvinyl chloride and the copolymers of vinyl chloride with a minor proportion of at least one vinyl comonomer, said polymer having the following characteristics:

a. a plasticizer capacity of at least 120 phr as determined by ASTM D-1755;

b. a bulk density of at least about 0.35 gm/cm^3; and,

c. a particle size distribution such that at least about 90 to 98%, by weight, is in the range of from about 50 to 120 microns.

3,917,549

PROCESS FOR THE POLYMERIZATION OF DODECALACTAM IN THE PRESENCE OF BORIC ACID

Genevieve Morival, and Remy Hebert, both of Serquigny, France, assignors to Ato Chimie, Courbevoie, France

Continuation-in-part of Ser. No. 191,475, Oct. 21, 1971. This application Dec. 21, 1973, Ser. No. 427,074
Claims priority, application France, Oct. 26, 1970, 70.38556
Int. Cl.^{2} C08G *69/16*
U.S. Cl. 260—18 N 10 Claims

1. A process for the polymerization of dodecalactam which comprises a first step wherein dodecalactam is polymerized at a temperature of between 280° and 335°C, in the presence of 0.05 to 2% be weight, of a boron acid or a salt or anhydride of said acid, and a second step wherein the polymerization is completed by maintaining the polymer from the first step at temperatures from 130° to 270°C.

3,917,550

PLASTISOLS CONTAINING BONDING AIDS

Wilhelm Clas, Duisburg-Meiderich, and Helmut Horstkorte, Monheim-Baumberg, both of Germany, assignors to Henkel & Cie GmbH, Dusseldorf-Holthausen, Germany

Filed May 30, 1974, Ser. No. 474,605
Claims priority, application Germany, June 1, 1973, 2327958
Int. Cl.^{2} C08L *27/06*
U.S. Cl. 260—23 EP 8 Claims

1. A PVC plastisol comprising

A. from 10 to 50% by weight of a plasticizable polymer selected from the group consisting of polyvinyl chloride and copolymers of vinyl chloride with up to 20% by weight of ethylenically-unsaturated monomers copolymerizable with vinyl chloride,

B. from 6 to 60% by weight of a plasticizer for polyvinyl chloride, with the proviso that said plasticizer component contains from 2 to 30% by weight of the plastisol of a plasticizer for polyvinyl chloride containing at least one vicinal epoxide group, said plasticizer containing said at least one vicinal epoxide group being selected from the group consisting of epoxidized soy bean oil, epoxidized linseed oil, the 2-ethylhexyl ester of epoxidized octyl oleate and the mixtures thereof, wherein the ratio of component A to component B is from 1:0.6 to 1:2,

C. from 0.05 to 3.0% by weight of a member selected from the group consisting of imidazole, alkylated imidazole, chlorinated imidazole, benzimidazole, an acid addition salt of said imidazoles with a weak acid, an acid addition salt of benzimidazole with a weak acid, and the mixtures thereof,

D. from 0.2 to 5% by weight of a basic metal stabilizer compound, and

E. from 0 to 70% by weight of inert materials selected from the group consisting of inorganic fillers and mineral pigments.

3,917,551

HOT MELT ADHESIVE

Lawrence D. Jurrens, and Leo L. Gingerich, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed June 7, 1974, Ser. No. 477,177
Int. Cl.^{2} C08K *5/01;* C08L *93/00*
U.S. Cl. 260—27 BB 9 Claims

1. A hot melt adhesive composition consisting essentially of a hydrogenated copolymer of a substituted or unsubstituted alkadiene having 4–12 carbon atoms and a substituted or unsubstituted vinylsubstituted aromatic monomer having 8–16 carbon atoms per molecule wherein substantially all of the olefinic unsaturation is hydrogenated, leaving the aromatic unsaturation, a tackifier and about 10 to about 30 parts by weight per about 40 to about 70 parts by weight of the copolymer of a liquid polyalkadiene having alkadiene units of 4–12 carbon atoms per molecule, having a weight average molecular weight in the range of about 500 to about 10,000 and being substantially free of other functional groups than C=C double bonds.

3,917,552

SELF POLISHING CLEANING FLOOR WAX

Edelbert Bischoff, Kirchheimbolanden, and Willi Hessler, Wiesbaden, both of Germany, assignors to Werner & Mertz GmbH, Mainz, Germany

Continuation of Ser. No. 395,591, Sept. 10, 1973, abandoned, Continuation of Ser. No. 235,781, March 17, 1972, abandoned. This application July 22, 1974, Ser. No. 490,406
Claims priority, application Germany, Mar. 26, 1971, 2114843
Int. Cl.^{2} C08L *91/08, 91/06*
U.S. Cl. 260—28.5 R 1 Claim

1. A selfgloss cleaning polish for a substrate consisting essentially of:

a. between 0.5 and 50% by weight of the dry polish of an oxidized linear low molecular weight oxidation cracked polyethylene wax made by the Phillips process and having a molecular weight between about 8,000 and 10,000, an acid number of about 26.1, an ester number of about 15.5, a softening point of 138° to 147°C and a density of D_{20}=0.99;

b. an aqueous dispersion of ethylacrylate - styrene copolymer or butylacrylate-styrene copolymer, in a weight ratio to said polyethylene wax of 3:1 to 1:1, and styrenemaleic acid anhydride in a weight ratio to said polyethylene wax between 1:3 and 1:10;

c. a glycol ether in a weight ratio to said polyethylene wax of 1:7 to 1:12;

d. potassium hydroxide in a weight ratio to said polyethylene wax of 1:20 to 1:60;

e. sodium thiosulfate in a weight ratio to said polyethylene wax of 1:50 to 1:250;

f. butylphthalate as a plasticizer in a weight ratio to said polyethylene wax of 1:5 to 1:1; and

g. 0.5 to 8.0 percent by weight of the dry polish trisodium phosphate as a cleaning compound.

3,917,553
STABILIZED POLYACRYLONITRILE COMPOSITIONS WITH SULFUR CONTAINING STABILIZER AND METHOD OF FORMING SAME

Darrell R. Thompson, Somerville, N.J., assignor to Celanese Corporation, New York, N.Y.

Continuation of Ser. No. 136,620, April 22, 1971, abandoned. This application June 4, 1973, Ser. No. 367,088

Int. Cl.[2] C08L *33/20*

U.S. Cl. 260—29.6 AN **8 Claims**

1. A stabilized film or fiber forming polyacrylonitrile composition consisting essentially of polyacrylonitrile containing at least 85 percent acrylonitrile and up to about 15 weight percent of at least one other ethylenically unsaturated material copolymerized therewith, a solvent which consists essentially of acetonitrile water mixtures, and from about 0.01 to about 3 weight percent, based on the weight of said polyacrylonitrile of a sulfur-containing stabilizer selected from the group consisting of dodecanethiol, mercaptosuccinic acid, benzenethiol, thiodiglycol, dibehenyl thiodipropionate, distearyl thiodipropionate and diethoxyethyl thiodipropionate.

3,917,554
BUTADIENE-ACRYLONITRILE ALTERNATING COPOLYMER SOLUTION-TYPE ADHESIVE

Sakae Inoue; Ken Yoneyama; Motokazu Kikuchi, all of Kodaira, and Nobuyuki Kataoka, Tokyo, all of Japan, assignors to Bridgestone Tire Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 861,961, Sept. 29, 1969, abandoned, and a continuation of Ser. No. 188,467, Oct. 12, 1971, abandoned. This application Oct. 10, 1973, Ser. No. 405,176

Int. Cl.[2] C08K *5/02, 5/04, 5/15;* **C08L** *9/02*

U.S. Cl. 260—30.4 A **6 Claims**

1. A butadiene-acrylonitrile alternating copolymer solution-type adhesive having 5–50 parts by weight of an adhesive composition composed of 100 parts by weight of a butadieneacrylonitrile alternating copolymer having a degree of alternation of not lower than 92 and an intrinsic viscosity of not lower than 1.0 in dimethylformamide at 30°C and containing no gel, wherein the butadiene units have a microstructure of substantially complete trans-1,4 bond, and 30–100 parts by weight of a phenol resin dissolved in 100 parts by weight of a solvent selected from the group consisting of ketones, amides, halogenated hydrocarbons and ethers, a mixed solvent of two or three of the solvents or a mixed solvent of said solvent with at least one of aromatic hydrocarbons and alcohols.

3,917,555
LUBRICANTS FOR THERMOSETTING RESIN MOLDING COMPOSITION

Kurt Worschech, Bexhoevede; Rudi Heyden, Hochdahl-Millrath; Kurt Wolf, Bremerhaven; Manfred Jaeckel, Loxstedt, and Michael Eckelt, Dusseldorf-Urdenbach, all of Germany, assignors to Neynaber Chemie GmbH, Bremerhaven, Germany

Filed May 22, 1974, Ser. No. 472,478

Claims priority, application Germany, May 26, 1973, 2326978

Int. Cl.[2] C08K *5/10*

U.S. Cl. 260—31.4 R **13 Claims**

1. An unhardened thermosetting resin composition containing thermosetting resin constituents selected from the group consisting of a phenoplast resin, an aminoplast resin and the mixtures thereof, and an effective amount of a lubricant additive useful in the shaping of thermosetting material comprising a partial or complete ester of (A) an addition product 8 to 100 mols of an alkylene oxide selected from the group consisting of ethylene oxide and mixtures of ethylene oxide and propylene oxide per mol of a hydrocarbon compound having 1 to 3 hydroxyl groups and 2 to 30 carbon atoms with (B) a hydrocarbon carboxylic acid having 1 to 3 carboxyl groups and 2 to 30 carbon atoms selected from the group consisting of an aliphatic carboxylic acid, a cycloaliphatic carboxylic acid and an aromatic carboxylic acid, with the proviso that at least one of the components (A) or (B) contains an aliphatic hydrocarbon radical of 11 to 26 carbon atoms.

3,917,556
PIGMENT PASTES

Heinz-Ewald Baurecht, Cologne; Manfred Preuss, Hilden; Karlheinz Wolf, Leverkusen, and Reinhold Hornle, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed June 21, 1974, Ser. No. 481,875

Claims priority, application Germany, June 22, 1973, 2331790; Feb. 1, 1974, 2404978

Int. Cl.[2] C08L *75/06*

U.S. Cl. 260—33.2 R **4 Claims**

1. Pigment pastes containing 3–20% by weight of an aliphatic polyester-polyurethane as the binder, which is obtained by reaction of a polyester-polyglycol of average molecular weight 500–3,000, based on hexanediol, optionally with the addition of neopentyl glycol, or based on 1,4-butanediol, and adipic acid, with isophoronediisocyanate or dicyclohexylmethane-4,4′-diisocyanate and subsequent lengthening of the molecular chain by means of isophoronediamine, 3–70% by weight of a pigment, 20–90% by weight of ethylene glycol monoalkyl ether and optionally up to 40% by weight of customary solvents.

3,917,557
METHOD FOR TREATING CRACKED GAS OIL

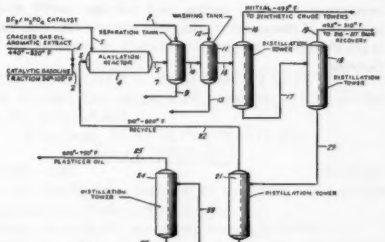
Merritt C. Kirk, Jr., Thornton, Pa., and Craig R. Andersson, East Liverpool, Ohio, assignors to Sun Ventures, Inc., St. Davids, Pa.

Continuation of Ser. No. 777,244, Nov. 20, 1968, abandoned, which is a continuation of Ser. No. 627,887, April 3, 1967, abandoned. This application Nov. 20, 1973, Ser. No. 417,662

The portion of the term of this patent subsequent to Apr. 8, 1986, has been disclaimed.

Int. Cl. C08f *45/28;* **C07c** *15/24*

U.S. Cl. 260—33.6 UA **13 Claims**



1. A polyvinyl chloride composition comprising a major amount of polyvinyl chloride and a minor amount of a plasticizer composition comprising a fraction boiling within the range of 600° to 750°F. prepared by the process of:

(a) contacting a cracked gas oil boiling substantially in the range of 400° to 650°F. with a C_3 to C_8 olefinic material in the presence of an alkylation catalyst and (b) recovering the fraction boiling in the range of 600° to 750°F.

3,917,558
FOUNDRY RESINS TREATED WITH NITRO COMPOUNDS

John J. Gardikes, Worthington, and Young D. Kim, Columbus, both of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Apr. 1, 1974, Ser. No. 456,594
Int. Cl.[2] C08K 5/32; C08L 61/34
U.S. Cl. 260—38 19 Claims

1. A resin composition comprising:

a. A foundry binder resin selected from the group consisting of furfuryl alcohol-formaldehyde, urea/furfuryl alcohol-formaldehyde, phenol/furfuryl alcohol-formaldehyde, phenol/urea/furfuryl alcohol-formaldehyde, phenol-formaldehyde, and urea/phenol-formaldehyde, and mixtures thereof, and

b. the reaction product of free formaldehyde present in said resin and a nitro compound having the formula:

where C is carbon, N is nitrogen, O is oxygen, H is hydrogen, and R_1 and R_2 are selected from the group consisting of hydrogen, hydrocarbon radicals, and members of one ring.

3,917,559
FLAME RETARDANT POLYCARBONATE COMPOSITION

Victor Mark, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 28, 1973, Ser. No. 429,165
Int. Cl.[2] C08K 5/42
U.S. Cl. 260—45.7 S 7 Claims

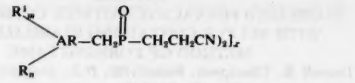
1. A flame retardant aromatic carbonate polymer composition comprising in admixture an aromatic carbonate polymer and a minor amount of a flame retardant additive which is the metal salt of a halocycloaliphatic aromatic sulfonic acid, wherein said metal salt thereof is selected from the group consisting of alkali metals and alkaline earth metals, and mixtures of these metal salts, and wherein the halo substituent is selected from the group consisting of bromine, chlorine and fluorine.

3,917,560
POLY (PHOSPHINE OXIDE) FLAME RETARDANTS FOR POLYMERS

Joseph Adrian Hoffman, Somerville, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 374,709, June 28, 1973, Pat. No. 3,895,048. This application Dec. 23, 1974, Ser. No. 535,624
Int. Cl.[2] C08G 6/00
U.S. Cl. 260—45.9 NP 9 Claims

1. A flame-retarded composition comprising (1) a polyolefin or a linear aromatic polyester and (2) a flame-retarding amount of a compound having the formula



wherein R and R^1 are, individually, methyl, ethyl or methoxy radicals, AR is benzene, naphthalene or anthracene and when AR is benzene, n and m are, individually, whole integers of 0–2, inclusive, x is a whole integer of 2–6, inclusive, and R and R^1 can combine to form a saturated, six-membered hydrocarbon ring in conjunction with two adjacent carbon atoms of the benzene ring, when AR is naphthalene, n and m are, individually, whole integers of 0–3, inclusive, and x is a whole integer of 2–4, inclusive, and when AR is anthracene, n and m are, individually, whole integers of 0–4, inclusive, and x is a whole integer of 2–6, inclusive.

3,917,561
PROCESS FOR PREPARING MELT-STABLE POLY(DODECAMETHYLENETEREPHTHALAMIDE

Richard D. Chapman, and Oscar A. Pickett, Jr., both of Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 456,101, March 29, 1974, abandoned. This application Dec. 23, 1974, Ser. No. 535,741
Int. Cl.[2] C08G 6/00
U.S. Cl. 260—45.75 C 5 Claims

1. A process for the preparation of melt-stable, fiber-forming poly(dodecamethyleneterephthalamide) by melt polymerization comprising

A. heating an aqueous solution of cation-exchange treated dodecamethylenediammoniumterephthalate in the presence of an additive consisting of a sterically hindered phenol, or benzenephosphinic acid, or copper added as copper acetate in combination with an alkali metal halide, or mixtures thereof in a vessel pressurized with an inert gas to a pressure ranging from 250 to 500 psig to a temperature between 285° and 320°C. while removing water from said vessel in the form of steam and while maintaining said pressure;

B. heating the resulting molten polymer to a temperature between 300° and 330°C. while reducing the pressure in said vessel to atmospheric pressure; and

C. holding said molten polymer at atmospheric pressure and at a temperature between 300° and 330°C. for a period of time sufficient to bring said molten polymer to equilibrium.

3,917,562
COMBINATION PROCESS FOR THE CONVERSION OF HEAVY DISTILLATES TO LPG

Lee Hilfman, Mt. Prospect, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed July 16, 1974, Ser. No. 489,014
Int. Cl.[2] B01J 29/22; C10G 13/08, 37/02
U.S. Cl. 208—59 8 Claims

1. A process for the conversion of heavy distillate hydrocarbons boiling above about 600°F. to produce LPG, which process comprises the steps of:

a. reacting said heavy distillate in a first reaction zone containing a catalytic composite comprising a porous carrier material, a Group VI-B metal component and a Group VIII metal component at hydrocracking conditions selected to convert the heavy distillate into lower boiling hydrocarbons;

b. reacting at least a portion of said lower boiling hydrocarbons in a second reaction zone containing a catalytic composite comprising a Group VIII metal component combined with an alumina carrier material containing a uniform distribution of finely divided mordenite particles which catalytic composite is prepared by commingling said mordenite with an aluminum halide sol, gelling the resultant mixture then calcining the gelled mixture

wherein said alumina carrier material contains from about 20 to about 30 weight percent mordenite, at hydrocracking conditions selected to produce LPG; and,

c. recovering said LPG from the resulting first and second zone reaction zone effluents.

3,917,563

PROCESS FOR THE PRODUCTION OF HIGH MOLECULAR WEIGHT POLYOXYMETHYLENE BY THE POLYMERIZATION OF TETRAOXANE

Yoshiaki Nakase; Masaru Yoshida, both of Takasaki; Tadashi Iwai, Kanagawa, and Akihiko Ito, Takasaki, all of Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

Continuation-in-part of Ser. No. 114,704, Feb. 11, 1971, abandoned. This application Oct. 23, 1973, Ser. No. 408,490
Claims priority, application Japan, Feb. 17, 1970, 45-13077
Int. Cl.² C08G 2/10
U.S. Cl. 260—67 FP **15 Claims**

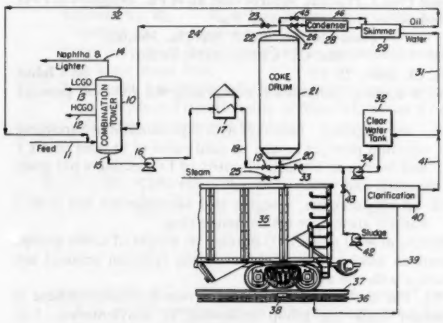
1. A process for producing a high molecular weight polyoxymethylene polymer by polymerizing tetraoxane in the solid phase at a temperature range of from about 60°C. to below 114°C. in the presence of from about 0.0001% to about 10% based on tetraoxane weight of a radical forming material as a catalyst.

3,917,564

DISPOSAL OF INDUSTRIAL AND SANITARY WASTES

Robert L. Meyers, Beaumont, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 7, 1974, Ser. No. 495,460
Int. Cl.² C10G 9/14
U.S. Cl. 208—131 **4 Claims**



1. A new use for a delayed coker in addition to its known operation wherein a body of hot liquid oil is maintained at thermal cracking temperature in an enlarged vessel for an extended period of time with discharge of cracked vapors for recovery of cracked product and accumulation of solid, porous coke in the vessel, whereupon the coke is steamed to reduce its temperature and liquid water is introduced to the coke to quench it to temperature at which it may be recovered, initially at a coke temperature hot enough to vaporize the water and finally at a coke temperature such that water fills voids in the coke;

said new use comprising addition to said liquid water during the initial stage of coke temperature hot enough to vaporize the water of liquid sludge which contains dispersed combustible matter and finely dispersed solid particles which may be the said combustible matter; whereby the dispersion is broken with incorporation of combustible matter therefrom in the coke while conducting quenching and recovery of said coke.

3,917,565

AROMATICS HYDROGENATION IN THE PRESENCE OF SULFUR

Manfred Josef Michlmayr, Walnut Creek, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 372,894, June 22, 1973, Pat. No. 3,876,529. This application Feb. 3, 1975, Ser. No. 546,663
Int. Cl.² C10G 23/04
U.S. Cl. 208—144 **6 Claims**

1. A process for, without substantial hydrocracking, reducing the amount of aromatics contaminants in a hydrocarbon feedstock boiling in the range 500°–1050°F. and comprised predominantly of paraffins and containing from 0.1 to 20 weight percent aromatics and 0 to 1000 ppm sulfur, which comprises:

A. contacting said feedstock and hydrogen in a reaction zone with a catalyst comprising palladium and mordenite exchanged to an extent of 5–80% of the available ion-exchange sites with a multivalent metal at a temperature in the range 300°–700°F., an LHSV from 0.1–20, and at a pressure from 0 to 3000 psig, and

B. recovering from said reaction zone a hydrocarbon product containing less than 8 ppm aromatics and less than 5 ppm sulfur.

3,917,566

PROCESS FOR MANUFACTURE OF LUBRICATING OIL

Eric J. Y. Scott, Princeton, and Robert L. Smith, Hopewell, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 8, 1974, Ser. No. 495,593
Int. Cl.² C10G 21/10, 29/04
U.S. Cl. 208—293 **17 Claims**

1. A process for forming a stabilized lubricating oil having acceptable corrosion properties and being resistant to oxidation and sludge formation upon exposure to an oxidative environment which comprises the sequential steps of (a) contacting a hydrocarbon lubricating oil stock with elemental sulfur in an amount of from about 0.05 to about 1.0 percent by weight of said oil stock at a contact temperature of from about 25° to about 130°C and pressure of from about 0 psig to about 100 psig, (b) contacting the product oil or step (a) containing unreacted sulfur with from about 10 to about 50 weight percent sulfide-forming metal at a contact temperature of from about 25° to about 150°C and pressure of from about 0 psig to about 100 psig, thereby forming a metal sulfide-containing residue, and (c) separating the product oil of step (b) from the metal sulfide-containing residue therein formed.

3,917,567

AIR CLASSIFIER FOR SHREDDED REFUSE

James M. Barrett, San Diego, Calif., assignor to City of San Diego, San Diego, Calif.

Filed Sept. 30, 1974, Ser. No. 510,453
Int. Cl.² B07B 4/02
U.S. Cl. 209—138 **6 Claims**

1. An air classifier for material to be sorted on a weight versus surface area basis comprising:

a plurality of vertically extending sorting columns;

a material input to a first one of said plurality of vertically extending sorting columns;

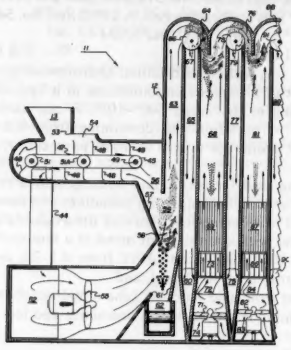
means for creating a rising air mass in said first one of said sorting colums having a velocity amplitude operable for raising a first fraction of said material;

a compression throat coupling said first sorting column to a second sorting column at the top portions thereof;

means for creating an upwardly moving column of air in said second sorting column having a lower velocity than the column of air in said first sorting column, said upwardly moving column of air having a velocity amplitude operable for raising a second fraction of said material;

an air exhaust column disposed in proximity and communicating with said compression throat;

a plurality of rotating air return vanes disposed between said compression throat and said air exhaust column; and



each of said sorting columns having an output port in a bottom portion thereof for discharging classified material.

3,917,568

ROTARY FLOW SEPARATOR FOR FINE GRAIN PARTICLES

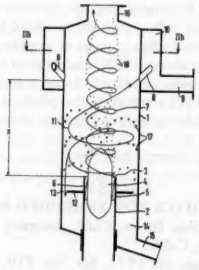
Heinrich Klein, and Rudolf Pieper, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Apr. 24, 1973, Ser. No. 353,949

Claims priority, application Germany, Apr. 26, 1972, 2220535

Int. Cl.² B04C *3/06*

U.S. Cl. 209—144 **12 Claims**



1. A rotary flow particle separator, comprising:

a cylindrical centrifugal chamber;

a coaxial inlet pipe disposed at one end of said chamber;

a coaxial outlet pipe disposed at the other end of said chamber;

a plurality of secondary air nozzles disposed in a single ring arrangement for directing a flow of air tangentially with respect to the inner surface of said chamber and at an angle towards said inlet pipe, the distance between said inlet pipe and said secondary nozzles being adjustable;

a particle outlet disposed concentrically about said inlet pipe and including means for rotating particle laden gas introduced therethrough; and

means for forming an annular gap at the outlet of said inlet pipe.

3,917,569

RECOVERY OF CARBON FROM SYNTHESIS GAS

George N. Richter, San Marino; William L. Slater, La Habra; Edward T. Child, Hacienda Heights, and John C. Ahlborn, Pomona, all of Calif., assignors to Texaco Inc., New York, N.Y.

Continuation of Ser. No. 319,407, Dec. 29, 1972, abandoned. This application June 28, 1974, Ser. No. 484,006

Int. Cl.² B01D *43/00*

U.S. Cl. 210—21 **9 Claims**

1. In a process in which a fossil fuel is subjected to partial oxidation to produce a gas comprising hydrogen and carbon monoxide and containing entrained carbon particles and from which gas the carbon particles are removed by scrubbing with water to produce a carbon-water dispersion, the improved two-stage hydrocarbon addition method of recovering carbon from said water dispersion in the form of a carbon-hydrocarbon oil dispersion which comprises mixing with said dispersion a light hydrocarbon oil in an amount just sufficient to render all of said carbon hyrophobic, said amount of light hydrocarbon oil on a weight basis being between 1 and 2 times the oil adsorption number of said carbon, passing the resulting mixture to a settling zone to permit the carbon to rise to the surface of the water, adding additional hydrocarbon oil to said settling zone adjacent the water surface to form an upper hydrocarbon oil layer containing dispersed carbon and a lower water layer, the amount of additional hydrocarbon oil being sufficient to form a carbon-hydrocarbon oil dispersion containing between 1 and 5 weight percent carbon and separately removing water and carbon-hydrocarbon oil dispersion from said settling zone.

3,917,570

POLYURETHANE POLYESTER-POLYOL COMPOSITIONS MODIFIED WITH AN ALKYLENIMINE

Wen-Hsuan Chang, Gibsonia; Roger L. Scriven, Penn Hills, and Paul J. Prucnal, Monroeville, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 16, 1973, Ser. No. 361,015

Int. Cl.² C08G *18/28, 18/06*

U.S. Cl. 260—75 TN **15 Claims**

1. A coating composition comprising the reaction product of:

A. an ungelled, carboxyl-hydroxyl-containing urethane reaction product having an acid value of at least about 1 and having an intrinsic viscosity of 1.0 deciliters per gram or less; and

B. an alkylenimine, wherein said alkylenimine has 2 or 3 carbon atoms per alkylenimine ring;

whereby at least about 0.03 percent by weight of acidic groups based on total weight of the urethane reaction product are reacted with the alkylenimine.

14. The method of claim **13** wherein said alkylenimine is selected from the group consisting of ethylenimine, 1,2-propylenimine and N-hydroxyethylethylenimine.

3,917,571

NON-ELASTOMERIC POLYURETHANE COMPOSITIONS FORMED FROM A MIXTURE OF A LOW MOLECULAR WEIGHT POLYOL AND AN HYDROXYL CONTAINING POLYOXYALKYLENE COMPOUND

Franciszek Olstowski, Freeport, and Donald B. Parrish, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 366,835, June 4, 1973, which is a continuation-in-part of Ser. No. 179,149, Sept. 9, 1971, abandoned. This application Dec. 17, 1973, Ser. No. 425,466

Int. Cl.² C08G *18/48*

U.S. Cl. 260—77.5 AP **21 Claims**

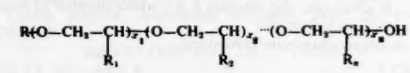
1. A non-elastomeric, non-cellular, solid polymer having a density of at least about 1 gram/cc and a percent elongation of less than 80 resulting from admixture of the components of a composition comprising:

A. a polyether polyol having from 3 to about 8 hydroxyl groups and a hydroxyl equivalent weight between about 75 and about 230,

B. an organic polyisocyanate,

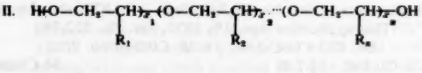
C. a liquid modifier compound having a boiling point above about 150°C selected from the group consisting of

1. a liquid partially capped, block or randomly formed polyoxyalkylene compound represented by the general formula

I. 

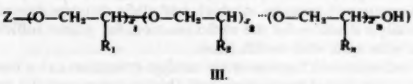
wherein each R is independently selected from saturated and unsaturated hydrocarbon groups having from about 1 to about 6, preferably from about 1 to about 3, carbon atoms; R_1, R_2, . . . and R_n are independetly hydrogen, an aryl group, an alkyl group or haloalkyl group, said alkyl or haloalkyl group having from about 1 to about 2 carbon atoms with the proviso that when R_1, R_2, . . . R_n is a haloalkyl group, it is present in a ratio of from about 0 to about 10 percent of the total R_1, R_2, ... R_n groups, and x_1, x_2, ... x_n are integers, the sum of which provides the partially capped polyoxyalkylene compound with a molecular weight of at least about 700;

2. a liquid, block or randomly formed polyoxyalkylene glycol represented by the general formula

II. 

wherein R_1, R_2, . . . R_n are as defined in formula I above and x_1, x_2, . . . x_n are integers, the sum of which provides the polyoxyalkylene glycol with an equivalent weight of at least about 700;

3. a liquid, random or block polyoxyalkylene poyol having a hydroxyl functionality of from 3 to about 8 represented by the general formula



III.

wherein R_1, R_2, ... R_n are as defined in formula I above, Z is in the residue of an initiator compound having from 3 to about 8 hydroxyl groups, x_1, x_2, ... x_n are integers, the sum of which provides the polyoxyalkylene polyol with a hydroxyl equivalent weight of at least about 500 and q is an integer having a value of from 3 to about 8; and

4. mixtures thereof; and

D. a non-amine containing catalyst for urethane formation, which is an organo metal compound;

wherein components (A) and (B) are present in amounts so as to provide an NCO:OH ratio of from about 0.8:1 to about 2:1, component (C) is present in quantities of from about 20 to about 50 percent with the proviso that when component (B) is a prepolymer containing less than about 40% NCO groups by weight, then Component (C) is present in quantities of from about 10% to about 50% by weight of the sum of components (A), (B) and (C); and component (D) is present in quantities of from about 0.2 to about 10 percent by weight of the sum of the weights of components (A), (B) and (C); and wherein said polymer can be demolded within less than about 5 minutes, without the application of an external source of heat, after admixture of said composition.

3,917,572

RESINOUS POLYBARBITURIC ACID DERIVATIVES

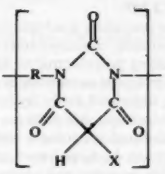
Augustin T. Chen, Cheshire, and William J. Farrissey, Jr., Northford, both of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Nov. 1, 1974, Ser. No. 519,924

Int. Cl.² C08G 18/30, 18/82; C08J 3/06

U.S. Cl. 260—77.5 R **9 Claims**

1. A polymer characterized by the recurring unit:



wherein R is the residue of an organic diisocyanate having the formula OCN—R—NCO selected from the group consisting of 2,4-toluene diisocyanate, 2,6-toluene diisocyanate, 4,4′-methylenebis(phenyl isocyanate), 2,4′-methylenebis(phenyl isocyanate), dianisidine diisocyanate, tolidine diisocyanate, hexamethylene diisocyanate, m-xylylene diisocyanate, 1,5-naphthalene diisocyanate, p-phenylene diisocyanate, 1,4-diethylbenzene-β,β'-diisocyanate, and mixtures of two or more of said diisocyanates, and X is selected from the group consisting of cyano, lower-alkanoyl, lower-carbalkoxy, aroyl, nitro and halo.

3,917,573

PROCESS FOR THE PREPARATION OF WATER EMULSIFIABLE ANIONIC RESINS AND THE RESINS THUS PRODUCED

Girish Girdhar Parekh, Stamford, and Werner Josef Blank, Wilton, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 293,211, Sept. 28, 1972, abandoned, which is a continuation-in-part of Ser. No. 139,912, May 3, 1971, abandoned. This application Jan. 24, 1974, Ser. No. 436,260

Int. Cl.² C08F 8/14

U.S. Cl. 260—78.5 T **10 Claims**

1. A process for preparing an anionic, water-dispersible, non-gelled, vinyl polymer containing carboxyl and alcoholic functions which comprises the steps of: initially copolymerizing by heating at a temperature between about 125°C. and 200°C. a blend of monomers comprising maleic anhydride and a different polymerizable α,β-ethylenically unsaturated compound in the presence of a free radical initiator and, thereafter, reacting the resultant polymer with an aliphatic diol containing from about 3 to 8 carbon atoms and possessing primary and secondary hydroxyl groups at a temperature between about 55°C. and 135°C. for a period of time sufficient to open the anhydride ring and to form the half ester of maleic acid thereby producing an anionic water dispersible, non-gelled, vinyl polymer, said monomers and diol being present in amounts sufficient to supply to the resultant overall polymer from about 1 to about 25% of the carboxyl function and from about 0.5 to about 10% of the hydroxyl function, based on the weight of the overall finished polymer, wherein the thus formed non-gelled polymer is substantially free from unreacted monomer.

3,917,574
PROCESS FOR PREPARING SUBSTANTIALLY LINEAR WATER-SOLUBLE OR WATER-DISPERSIBLE INTERPOLYMERIC INTERFACIALLY SPREADING POLYELECTROLYTES

Dale S. Gibbs; Paul B. Simons; Robert D. Vandell, and Ritchie A. Wessling, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 16, 1973, Ser. No. 351,714
Int. Cl.[2] C08F *1/13, 7/04, 15/00*
U.S. Cl. 260—79.3 MU **2 Claims**

1. A process for preparing a substantially linear water-soluble or water-dispersible, noncopolymerizable interpolymeric interfacially spreading polyelectrolyte wherein

1. said polyelectrolyte is composed of a mixture of nonionic hydrophobic units and ionic hydrophilic units wherein said nonionic hydrophobic units are copolymerized ethylenically unsaturated monomers which when in the form of an amorphous homopolymer is less than about 0.1 percent soluble in water and wherein said monomer has no substituent extending more than about 10 Angstrom units from the point of ethylenic unsaturation said unit being randomly distributed in the backbone of said polyelectrolyte and wherein said ionic hydrophilic units are copolymerized ethylenically unsaturated monomers which when in the form of amorphous homopolymers are soluble in water and wherein said ionic hydrophilic units remain substantially completely ionized over the entire pH range of 0 to 14, and
2. said polyelectrolyte when incorporated into a dispersion is adsorbed at the disperse phase of said dispersion in a substantially flat configuration and where the area occupied by each ionic hydrophilic unit of said polyelectrolyte at the disperse phase surface is from about 60 to 100 square Angstrom units per ionic hydrophilic unit, and wherein said polyelectrolyte has an adsorption constant equal to or greater than 1 at the point where the disperse phase is saturated with said polyelectrolyte wherein said adsorption constant is determined as the amount of polyelectrolyte in the disperse phase divided by the amount of polyelectrolyte in the continuous phase;

said process comprising the homogeneous continuous monomer addition polymerization of at least one monomer capable of providing said ionic hydrophilic units said monomer being selected from the group consisting of 2-sulfoethylmethacrylate and 2-acrylamido-2-methyl propane sulfonic acid and at least one monomer capable of providing said nonionic hydrophobic units said monomer being selected from the group consisting of acrylonitrile methacrylonitrile, methyl acrylate, methyl methacrylate, n-butyl methacrylate, butyl acrylate, hexyl acrylate, dibutyl maleate, styrene vinyl toluene, vinyl chloride, vinyl acetate, vinyl propionate, ethyl vinyl ethr, butyl vinyl ether and t-butyl styrene, said polmerization taking place in dioxane as a mutual solvent wherein the monomers are added to a polymerization reactor at a rate no greater than the rate of polymerization and in a ratio which is substantially equal to that desired in the resulting polymer phase.

3,917,575
PROCESS FOR PRODUCTION OF POLYOLEFINS

Kazuo Matsuura, Kawasaki; Nobuyuki Kuroda, Yokohama; Mitsuji Miyoshi, Kanagawa, and Masaomi Matsuzaki, Yokohama, all of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Filed Nov. 7, 1973, Ser. No. 413,431
Claims priority, application Japan, Nov. 11, 1972, 47-113218; Dec. 22, 1972, 48-000353
Int. Cl.[2] C08F *4/50, 10/02*
U.S. Cl. 260—88.2 R **10 Claims**

1. A process for the production of polyolefins which comprises polymerizing or copolymerizing olefins in the presence of a composite catalyst consisting essentially of:

a product of reaction between an ether solution of an organomagnesium compound and a titanium compound, said ether being the sole solvent in the reaction system, at a temperature of at least about 100°C, with the molar ratio of titanium to magnesium at least about 3 to 1, said titanium compound being defined by the general formula, $Ti(OR)_nX_{4-N}$, wherein R is selected from the class consisting of alkyl, allyl, aryl and aralkyl groups, wherein X is a halogen, and wherein n is a whole number of from 0 to 4 inclusive; and

an organoaluminum compound.

3,917,576
MOLECULAR WEIGHT REDUCTION OF UNSATURATED POLYMERS

Carl A. Uraneck, and James D. Brown, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 72,241, Sept. 14, 1970, abandoned. This application Apr. 19, 1973, Ser. No. 352,741
Int. Cl.[2] C08C *2/00, 19/08;* **C08F** *6/06, 8/50*
U.S. Cl. 260—94.7 D **34 Claims**

1. The process of modifying the properties of a polymer by effecting a decrease in molecular weight or inherent viscosity wherein said polymer is characterized by a carbon backbone with internal unsaturation in the polymer carbon backbone and an initial weight average molecular weight of at least about 1000 up to about 10,000,000 as determined by light scattering, wherein said process comprises contacting said polymer with an olefin disproportionation catalyst comprising a homogeneous catalyst under contacting conditions of temperature and pressure at which said olefin disproportionation catalyst is active for the olefin reaction, for a time sufficient to effectuate said modification,

wherein said homogeneous catalyst comprises (a) a transition metal compound, and (b) an organometallic compound, wherein said (a) can be represented by the formula $[(L)_aM_cZ_d]_x$ wherein each (L) represents an organic ligand; M is molybdenum, tungsten, rhenium, ruthenium, or rhodium; Z is a halide, CN, SCN, OCN, or $SnCl_3$ radical; a and d each represent a number 1 to 5, c represents a number 1 to 4; x represents a number indicative of the polymeric state of the compound;

wherein said (b) component of said homogeneous catalyst is an organometallic adjuvant comprising (1) R_eAlX_f, (2) a mixture of compounds of (1), (3) a mixture of one or more of AlX_3 or R_eAlX_f compounds with one or more compounds represented by the formula $R_g{}^1M^1X_h$, (4) $R_gM^1Y_h$ compound, (5) AlX_3 compound, or (6) $M^1M^2H_j$, wherein each R is an aromatic or saturated aliphatic hydrocarbon radical having up to 20 carbon atoms including alkoxy and halo derivatives thereof, wherein each X is halogen, Y is halogen or hydrogen, each M^1 is a metal of Group IA, IIA, IIB, or IIIA, except A1, each M^2 is a metal of Group IA, IIA, IIB, or IIIA; e represents a number of 1 to 3, f represents a number of 0 to 2, such that the sum of e and f equals 3; g represents a number of 1 to 3, h represents a number of from 0 to 2, such that the sum of g and h is equal to the valence of M^1, j is an integer equal to the sum of the valences of M^1 and M^2.

3,917,577
CONTINUOUS PRODUCTION OF ETHYLENE HOMOPOLYMERS

Hans-Georg Trieschmann, Hambach; Helmut Pfannmueller; Friedrich Urban, both of Limburgerhof; Oskar Buechner; Klaus Steigerwald, both of Ludwigshafen, and Wolfgang Ball, Mannheim, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine). Germany

Continuation of Ser. No. 858,858, Sept. 17, 1969, abandoned. This application Aug. 26, 1971, Ser. No. 175,324

Claims priority, application Germany, Sept. 20, 1968, 1795365

Int. Cl.[2] C08F *4/34, 10/02, 110/02*

U.S. Cl. 260—94.9 R **1 Claim**

1. A process for the continuous production of ethylene homopolymers having a density of from 0.923 to 0.927 g/ccm by polymerization of ethylene under the action of a free-radical polymerization initiator and a polymerization regulator at a reaction temperature of from 160° to 350°C and a pressure of from 2100 to 4000 atmospheres in a tubular reactor having two or three successive reaction zones of about the same length, a mixture of ethylene, polymerization initiator and polymerization regulator being continuously introduced into the reactor at the beginning of each reaction zone, wherein

1. at the beginning of the first reaction zone a mixture is introduced which has a temperature of from 160° to 200°C, which is under a pressure of from 2100 to 4000 atmospheres and which contains ethylene, from 2 to 100 mole ppm (with reference to ethylene) of a free-radical polymerization initiator and from 0.3 to 0.7 parts by weight per 100 parts by weight of ethylene of the polymerization regulator propionaldehyde;
2. at the beginning of the second reaction zone a mixture is introduced which has a temperature of from 170° to 210°C. which is under a pressure of from 2100 to 4000 atmospheres and which contains ethylene, from 2 to 100 mole ppm (with reference to ethylene) of a free-radical polymerization initiator and from 40 to 60% by weight of the amount of the polymerization regulator propionaldehyde introduced per 100 parts by weight of ethylene into the first reaction zone; and when there is a third reaction zone,
3. at the beginning of the third reaction zone a mixture is introduced which has a temperature of from 170° to 210°C, which is under a pressure of from 2100 to 4000 atmospheres and which contains ethylene, from 2 to 100 mole ppm (with reference to ethylene) of a free-radical polymerization initiator and from 40 to 60% by weight of the amount of the polymerization regulator propionaldehyde introduced per 100 parts by weight of ethylene into the second reaction zone; with the proviso that the ratio by weight of the mixture introduced per unit time into the first and second reaction zones is from 1:2 and 2:1 and, when there is a third reaction zone, the ratio by weight of the mixture introduced per unit time into the second and third reaction zones is from 1:2 to 2:1.

3,917,578
PROCESS FOR PRODUCING SOMATOSTATIN AND INTERMEDIATES

Hans U. Immer, Mount Royal; Kazimir Sestanj, Pointe Claire; Verner R. Nelson, Kirkland, and Manfred K. Gotz, Hudson, all of Canada, assignors to Ayerst McKenna and Harrison Ltd., Montreal, Canada

Filed Dec. 10, 1973, Ser. No. 423,352

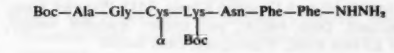
Int. Cl.[2] C07C *103/52;* **C07G** *7/00*

U.S. Cl. 260—112.5 **21 Claims**

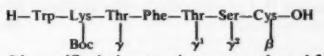
1. A process for preparing a tetradecapeptide of formula 1

H-Ala-Gly-Cys-Lys-Asn-Phe-Phe-Trp-Lys-Thr-Phe-Thr-Ser-Cys-OH

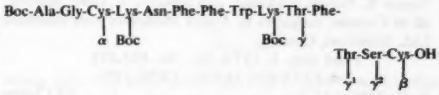
which comprises reacting a first heptapeptide of the (1) formula



in which α is a sulfhydryl protecting group selected from the group consisting of acetamidomethyl or Trt with a second heptapeptide of the formula



in which β is a sulfhydryl protecting group selected from the group consisting of acetamidomethyl or Trt and γ, γ^1 and γ^2 are either hydrogen or the hydroxy protecting group Bu^+ with the provisos that when γ is hydrogen γ^1 and γ^2 are hydrogen and that when γ is Bu^+ γ^1 and γ^2 are Bu^+, in the presence of an organic nitrite and a mineral acid according to the azide coupling method to obtain the linear tetradecapeptide of formula



in which α, β, γ, γ^1 and γ^2 are as defined herein; followed by subjecting said linear tetradecapeptide to treatment with iodine or thiocyanogen to obtain the corresponding cyclic disulfide derivative and subsequently treating said cyclic disulfide derivative in the presence of a concentrated organic acid or an aqueous solution of a mineral acid under moderately acidic conditions appropriate to remove the acetamidomethyl, Trt, Bu^+ or Boc protecting groups to obtain the desired tetradecapeptide of formula 1; or followed by subjecting said linear tetradecapeptide to treatment with either mercuric acetate, mercuric chloride, silver acetate or silver nitrate or remove selectively the sulfhydryl protecting groups to obtain the mercuric or disilver salt, respectively, of the corresponding disulfhydryl derivative; converting the latter salt to its corresponding free disulfhydryl derivative by treatment with hydrogen sulfide, oxidizing said last-named derivative by treatment with oxygen, 1,2-diiodoethane, sodium or potassium ferricyanide or iodine to obtain the corresponding cyclic disulfide derivative and treating said cyclic disulfide derivative in the presence of a concentrated organic acid or an aqueous solution of a mineral acid under moderately acidic conditions appropriate to remove the acetamidomethyl, Trt, Bu^+ or Boc protecting groups to obtain the desired tetradecapeptide of formula 1.

3,917,579
DES-ASP[1]-ILE[8]ANGIOTENSIN II AS A SPECIFIC INHIBITOR FOR THE RELEASE OF ALDOSTERONE

Francis Merlin Bumpus, 75 Winterberry Lane, Chagrin Falls, Ohio 44022; Mahesh Chandra Khosla, 7415 Warwick Lane, Chesterland, Ohio 44026, and Robert Rudolph Smeby, 36801 Riviera Road, Willoughby, Ohio 44094

Filed June 20, 1974, Ser. No. 481,083

Int. Cl.[2] C07C *103/52;* **A61K** *37/00*

U.S. Cl. 260—112.5 **1 Claim**

1. The heptapeptide L-Arg-L-Val-L-Tyr-L-Ile-L-His-L-Pro-L-Ile.

3,917,580
DES-ASP[1]-THR[8] ANGIOTENSIN II AS A SPECIFIC INHIBITOR FOR THE RELEASE OF ALDOSTERONE

Francis Merlin Bumpus, 75 Winterberry Lane, Chagrin Falls, Ohio 44022; Mahesh Chandra Khosla, 7415 Warwick Lane, Chesterland, Ohio 44026, and Robert Rudolph Smeby, 36801 Riviera Road, Willoughby, Ohio 44094

Filed June 20, 1974, Ser. No. 481,084
Int. Cl.[2] C07C *103/52;* **A61K** *37/00*
U.S. Cl. 260—112.5 **1 Claim**

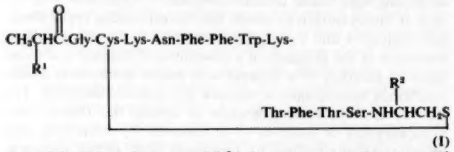
1. The heptapeptide L-Ary-L-Val-L-Tyr-L-Ile-L-His-L-Pro-L-Thr.

3,917,581
DERIVATIVES OF SOMATOSTATIN AND PROCESS THEREFOR

Hans U. Immer, Mount Royal; Kazimir Sestanj, Pointe Claire; Verner R. Nelson, Kirkland, and Manfred K. Gotz, Hudson, all of Canada, assignors to Ayerst McKenna And Harrison Ltd., Montreal, Canada

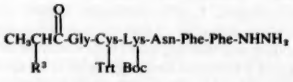
Filed Aug. 1, 1974, Ser. No. 493,595
Int. Cl.[2] C07C *103/52;* **C07G** *7/00*
U.S. Cl. 260—112.5 **17 Claims**

1. A process for preparing a tetradecapeptide of formula I

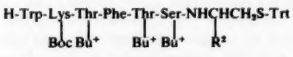


(I)

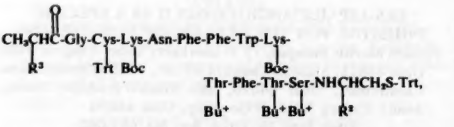
in which R^1 is hydrogen and R^2 is hydrogen or carboxyl, or R^1 is amino and R^2 is hydrogen, which comprises: reacting in the presence of an organic nitrite and a mineral acid according to the azide coupling method a first heptapeptide derivative of formula



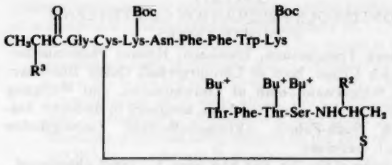
in which R^3 is hydrogen or Boc-NH- with a second heptapeptide derivative of formula



in which R^2 is as defined herein with the proviso that when R^2 is hydrogen then R^3 is hydrogen or Boc-NH- and when R^2 is carboxyl then R^3 hydrogen to obtain the linear tetradecapeptide derivative of formula



in which R^2 and R^3 are as defined herein, followed by oxidizing said linear tetradecapeptide derivative with iodine or thiocyanogen to obtain the corresponding cyclic disulfide derivative of formula



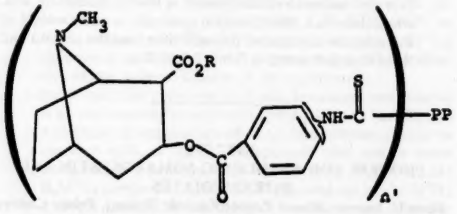
and subsequently treating said cyclic disulfide derivative in the presence of a concentrated organic acid or an aqueous solution of a mineral acid under moderately acidic conditions appropriate to remove the Bu^+ and BOC protecting groups to obtain the corresponding tetradecapeptide derivative of formula I; or followed by subjecting said linear tetradecapeptide derivative to treatment with either mercuric acetate, mercuric chloride, silver acetate or silver nitrate to remove selectively the sulfhydryl protecting groups to obtain the mercuric or disilver salt, respectively, of the corresponding disulfhydryl derivative; converting the latter salt to its corresponding free disulfhydryl derivative by treatment with hydrogen sulfide, oxidizing said last-named derivative by treatment with oxygen, 1,2-diiodoethane, sodium on potassium ferricyanide or iodine to obtain the corresponding cyclic disulfide derivative and treating said cyclic disulfide derivative in the presence of a concentrated organic acid or an aqueous solution of a mineral acid under moderately acidic conditions appropriate to remove the Bu^+ and BOC protecting groups to obtain the desired tetradecapeptide derivative of formula 1.

3,917,582
ISOTHIOCYANATE AND THIOUREA DERIVATIVES OF BENZOYL ECGONINE CONJUGATED TO POLYPEPTIDES

Michael J. Soffer, Redwood City, and Richard S. Schneider, Sunnyvale, both of Calif., assignors to Syva Corporation, Palo Alto, Calif.

Filed June 13, 1973, Ser. No. 369,658
Int. Cl. C07g *7/00, 7/02;* **C08h** *1/00*
U.S. Cl. 260—121 **5 Claims**

1. A conjugated antigenic poly(amino acid):



wherein:

R is hydrogen or methyl;

PP is an antigenic poly(amino acid) of at least 1000 molecular weight bonded through amino groups to form a thiourea; and

n' is the number of groups bonded to the poly(amino acid), and in the range of about one to the molecular weight of the poly(amino acid) divided by 1000.

3,917,583

2-SUBSTITUTED CYCLIC AMP DERIVATIVES

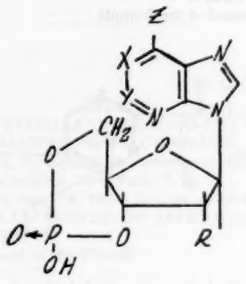
Rich B. Meyer, Laguna Beach, and Dennis A. Shuman, Mission Viejo, both of Calif., assignors to ICN Pharmaceuticals, Inc., Irvine, Calif.

Continuation-in-part of Ser. No. 277,868, Aug. 4, 1972, which is a continuation-in-part of Ser. No. 255,804, May 22, 1972. This application Feb. 7, 1973, Ser. No. 330,306

Int. Cl.² C07H *19/20*

U.S. Cl. 260—211.5 R 11 Claims

1. A compound of the structure:



and physiologically acceptable salts thereof, wherein X is N or N-oxide; Y is N or CR_1 in which R_1 is C_1 to C_8 alkyl, phenyl, 2-C_5H_4N, trihalomethyl, SH or SR_2 where R_2 is C_1 to C_8 alkyl or arralkyl; Z is NH_2 or OH: and R is H, OH or OR' where R' is C_1 to C_{18} acyl; provided that Z is OH only when X and Y are N, and X is N-oxide only when Y is N and Z is NH_2.

3,917,584

6-ACYL DERIVATIVES OF AMINOPENICILLANIC ACID

André Furlenmeier, Basel; Paul Lanz, Muttenz, both of Switzerland; Karl Vogler, deceased, late of Riehen, Switzerland (by Heinrich Vogler, Franziska Elizabeth Vogler, Niklaus Edward Vogler, heirs), and Guido Zanetti, Reinach, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Dec. 27, 1972, Ser. No. 318,738

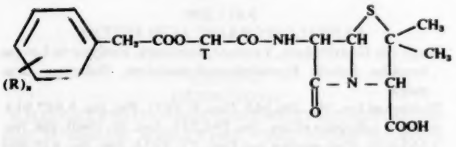
The portion of the term of this patent subsequent to Apr. 9, 1991, has been disclaimed.

Claims priority, application Switzerland, Jan. 12, 1972, 435/72

Int. Cl.² C07D *499/44*

U.S. Cl. 260—239.1 11 Claims

1. A compound selected from those represented by the formula



wherein R is halogen, lower alkyl, lower alkoxy, lower alkylamino, di-lower alkylamino or lower alkanoylamino, *n* is an integer of 0-2 and T is a C_2–C_5 alkyl group, pharmaceutically acceptable salts and hydrated forms thereof.

3,917,585

NEW AZA-10,11-DIHYDRO-5H-DIBENZO[B,E]-[1,4]-DIAZEPINE

Walter Von Bebenburg, Buchschlag, Germany, assignor to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

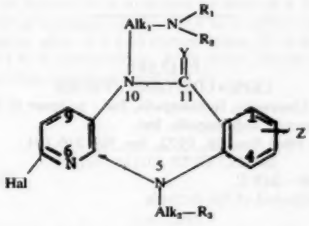
Filed Sept. 4, 1973, Ser. No. 394,396

Claims priority, application Austria, Sept. 6, 1972, 7644/72

Int. Cl.² C07D *471/04*

U.S. Cl. 260—239.3 T 14 Claims

1. Aza-10, 11-dihydro-5H-dibenzo[b,e]-[1,4] diazepines of the formula



where Alk_1 and Alk_2 are alkylene groups of 1 to 6 carbon atoms, R_1 and R_2 individually are alkyl groups of 1 to 5 carbon atoms or together with the adjacent nitrogen atom form a piperidinyl, pyrrolidinyl, morpholino, piperazinyl or homopiperazinyl, R_3 is hydrogen, a hydroxyl group, a cycloalkyl group with 3 to 6 carbon atoms or a halogen atom, Hal is a halogen atom, Y is an oxygen atom, sulfur atom, or an NH group and Z is a hydrogen atom, an alkyl group with 1 to 5 carbon atoms, a halogen atom, a hydroxy group, a nitro group or an —OR group or pharmacologically acceptable salts thereof.

13. A compound according to claim 11 wherein Y is O.

3,917,586

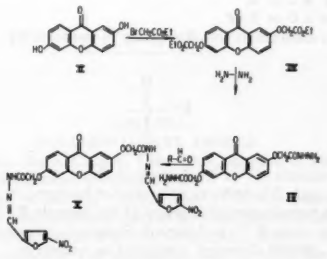
[(9-OXOXANTHENE-2,6-DIYL)DIOXY]DIACETIC ACID, DIETHYL ESTER, DIHYDRAZIDES AND DERIVATIVES THEREOF

Arthur A. Santilli, Havertown, and Anthony C. Scotese, King of Prussia, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

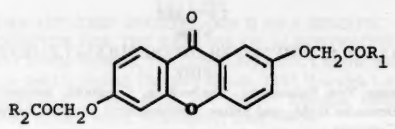
Filed May 8, 1974, Ser. No. 468,054

Int. Cl.² C07D *311/86*

U.S. Cl. 260—240.1 3 Claims



1. A compound selected from those having the formula



where R_1 and R_2 are the same and are selected from the class consisting of hydrazino and nitrofurfurylidene hydrazino; and its pharmaceutically acceptable acid addition salts.

3,917,587

CEPHALOSPORIN ETHERS

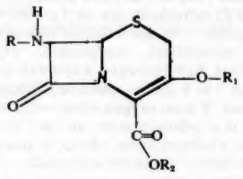
Robert R. Chauvette, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Nov. 28, 1972, Ser. No. 310,191

Int. Cl.² C07D *501/18, 501/20*

U.S. Cl. 260—243 C **30 Claims**

1. A compound of the formula



wherein R is hydrogen, or an acyl group of the formula

wherein R′ is

a. C_1-C_7 alkyl, C_3-C_7 alkenyl, cyanomethyl, halomethyl, 4-amino-4-carboxybutyl, 4-protected amino-4-carboxybutyl; or

b. the group R″ wherein R″ is 1,4-cyclohexadienyl, phenyl, or phenyl substituted by halogen, hydroxy, nitro, amino, cyano, C_1-C_4 lower alkyl, C_1-C_4 lower alkoxy, hydroxymethyl, aminomethyl, protected aminomethyl, carboxy or carboxymethyl; or

c. an arylalkyl group of the formula $R''—(Y)_m—CH_2—$ wherein R″ is as defined above,

Y is O or S,

m is 0 or 1; or

d. a substituted arylalkyl group of the formula

wherein R‴ is R″ as defined above, 2-thienyl or 3-thienyl, Z is hydroxy or protected hydroxy; or

e. a heteroarylmethyl group of the formula $R''''—CH_2—$ wherein R‴′ is 2-thienyl, 3-thienyl, 2-furyl, 3-furyl, 2-thiazyl, 2-oxazyl, 5-tetrazyl or 1-tetrazyl;

and wherein

R_1 is hydrogen, methyl, ethyl, 3-methyl-2-butenyl or diphenylmethyl;

R_2 is hydrogen or a carboxylic acid protecting ester forming group;

and when R_2 is hydrogen, the pharmaceutically acceptable nontoxic salts thereof;

with the limitation that when R_1 is hydrogen, R_2 is a carboxylic acid protecting ester forming group.

3,917,588

α-AMINOACYL CEPHALOSPORIN ETHERS

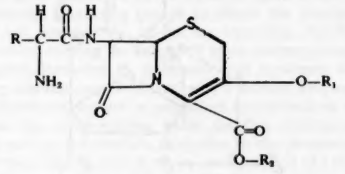
Robert R. Chauvette, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Nov. 28, 1972, Ser. No. 310,190

Int. Cl.² C07D *501/18, 501/20*

U.S. Cl. 260—243 C **10 Claims**

1. A compound of the formula



wherein

R is phenyl, hydroxyphenyl, halophenyl, methylphenyl, methoxyphenyl, 2-thienyl, 3-thienyl or 2-furyl;

R_1 is hydrogen, methyl, ethyl or 3-methyl-2-butenyl;

R_2 is hydrogen or a carboxylic acid protecting ester forming group;

and when R_2 is hydrogen the pharmaceutically acceptable nontoxic salts thereof; with the limitation that when R_1 is hydrogen, R_2 is a carboxylic acid protecting ester forming group.

3,917,589

PROCESS FOR THE MANUFACTURE OF 6-METHYL-3,4-DIHYDRO-1,2,3-OXATHIAZINE-4-ONE-2,2-DIOXIDE

Karl Clauss, Eppenhain, Taunus, and Harald Jensen, Frankfurt am Main, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Dec. 28, 1973, Ser. No. 429,628

Claims priority, application Germany, Dec. 30, 1972, 2264235

Int. Cl.² C07D *291/06*

U.S. Cl. 260—243 R **6 Claims**

1. In a process for the manufacture of 6-methyl-3,4-dihydro-1,2,3-oxathiazine-4-one-2,2-dioxide by cyclization of acetoacetic acid amide-N-sulfofluoride with aqueous lye, the improvement which comprises preparing said acetoacetic acid amide-N-sulfofluoride by splitting off carbon dioxide and alkene from an addition product of acetoacetic acid tert-alkyl ester and fluorosulfonylisocyanate at a temperature of from 60° to 100°C.

3,917,590

CEPHALOSPORANIC ACID ESTERS

Wagn Ole Godtfredsen, Vaerlose, Denmark, assignor to Lovens kemiske Fabrik Produktionsaktieselskab, Ballerup, Denmark

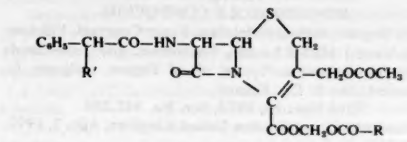
Division of Ser. No. 206,565, Dec. 9, 1971, Pat. No. 3,847,913, which is a division of Ser. No. 794,751, Jan. 28, 1969, Pat. No. 3,655,658. This application Dec. 27, 1973, Ser. No. 428,894

Claims priority, application United Kingdom, Jan. 30, 1968, 4821/68

Int. Cl.² C07D *501/28*

U.S. Cl. 260—243 C **3 Claims**

1. A compound of the formula:



or a hydrochloride thereof in which R′ is azido or p-nitrobenzyloxycarboxamido, and R is lower alkyl or phenyl.

3,917,591

7-[2-(CYCLOALKYLENEIMINO-2-YL)THIOACETAMIDO]CEPHALOSPORANIC ACID

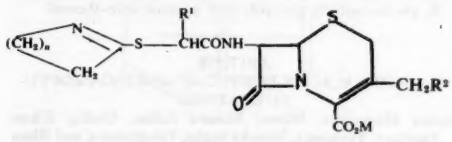
Peter H. L. Wei, Springfield, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Mar. 18, 1974, Ser. No. 452,015

Int. Cl.² C07D *501/34;* **A61K** *31/545*

U.S. Cl. 260—243 C **5 Claims**

1. A compound of the formula:



in which

R^1 is a member selected from the group consisting of —H, phenyl, tolyl, ethylphenyl and dimethyl phenyl;

R^2 is a member selected from the group consisting of —H, alkanoyloxy of 2 to 6 carbon atoms and, when taken with the 3-carboxyl group,

M is a member selected from the group consisting of —H, an alkali metal and $—NH_4$;

n is one of the integers 2, 3 or 4;

and the pharmaceutically acceptable hydrohalide acid addition salts thereof.

3,917,592

HERBICIDAL N-HALOACETYL-1,2-DIHYDRO-4H-3,1-BENZOXAZINE

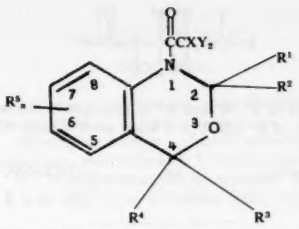
John W. Kobzina, Walnut Creek, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sept. 27, 1974, Ser. No. 509,979

Int. Cl.² C07D *265/00, 273/00, 295/00;* **A01N** *9/00*

U.S. Cl. 260—244 **11 Claims**

1. A compound of the formula



wherein X is fluoro, chloro or bromo, Y is hydrogen, fluoro, chloro, or bromo, R^1 is hydrogen or alkyl of 1 to 6 carbon atoms, R^2 is hydrogen or alkyl of 1 to 6 carbon atoms, R^3 is hydrogen or alkyl of 1 to 6 carbon atoms, R^4 is hydrogen or alkyl of 1 to 6 carbon atoms, R^5 is chloro, bromo or alkyl of 1 to 6 carbon atoms, and *n* is 0, 1 or 2.

3,917,593

N-ALKENYL AND N-ALKYNYL (2-QUINOLYL)THIO-ACETAMIDES

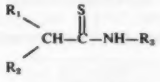
Bernard Loev, Broomall, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 255,828, May 22, 1972, Pat. No. 3,825,547. This application Apr. 12, 1974, Ser. No. 460,313

Int. Cl.² C07D *215/12, 295/10*

U.S. Cl. 260—247.1 L **6 Claims**

1. A compound of the formula:



in which:

R_1 is 2-quinolyl;

R_2 is hydrogen, lower alkyl, lower alkenyl, lower alkoxy, allyloxy, cyclopropanemethoxy, phenyl, benzyl or $—(CH_2)_n—NR_4R_5$;

R_3 is an allyl or propargyl group optionally substituted by methyl or ethyl groups, said R_3 having 3–6 carbon atoms; R_4 and R_5 are lower alkyl or taken together with the nitrogen atom to which they are attached form a piperidino, pyrrolidino, morpholino or N-lower alkylpiperazino ring and

n is 0 or 1

or a pharmaceutically acceptable acid addition salt thereof.

3,917,594

N-3-AMINOALKYL AMIDES

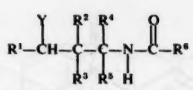
Donald Irvin Hoke, Chagrin Falls, Ohio, assignor to The Lubrizol Corporation, Cleveland, Ohio

Continuation of Ser. No. 272,529, July 17, 1972, abandoned, which is a continuation-in-part of Ser. No. 203,853, Dec. 1, 1971, which is a division of Ser. No. 832,412, June 11, 1969, Pat. No. 3,666,810. This application Sept. 6, 1973, Ser. No. 394,697

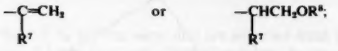
Int. Cl.² C07D *295/14*

U.S. Cl. 260—247.2 A **15 Claims**

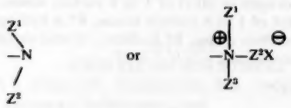
1. A compound of the formula



wherein each of R^1, R^2 and R^3 is hydrogen or a lower alkyl radical; each of R^4 and R^5 is a lower alkyl radical; R^6 is



R^7 is hydrogen or a lower alkyl radical; R^8 is a lower alkyl radical; Y is



X is a salt-forming anion;

is the piperidino, pyrrolidino or morpholino radical; and Z^3 is hydrogen or a lower alkyl radical.

3,917,595

4-METHYL-α,2-DIPHENYL-5-PYRIMIDINEMETHANOL

Thomas J. Schwan, Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Nov. 1, 1974, Ser. No. 520,011

Int. Cl.² C07D *239/00*

U.S. Cl. 260—251 R **1 Claim**

1. 4-methyl-α, 2-diphenyl-5-pyrimidinemethanol.

3,917,596

9-(14-PHENYL-PIPERAZINO)-ALKYL)-ADENINES

Werner Winter, Viernheim; Max Thiel, Mannheim; Kurt Stach, Mannheim-Waldhof; Wolfgang Schaumann, Heidelberg, and Androniki Roesch, Lampertheim, all of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Germany

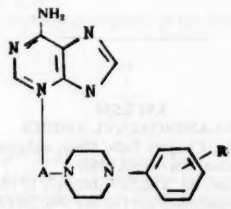
Filed Sept. 4, 1973, Ser. No. 394,366

Claims priority, application Germany, Sept. 14, 1972, 2245061

Int. Cl.² C07D *473/34*

U.S. Cl. 260—252 **9 Claims**

1. A 9-[(4-phenyl-piperazino)-alkyl]-adenine of the formula



wherein

A is a lower alkylene radical having 2 to 5 carbon atoms, and

R is a hydrogen or halogen atom or a lower alkoxy radical having up to 5 carbon atoms,

or a salt thereof with a pharmacologically compatible acid.

3,917,597

BENZODIOXOLE COMPOUNDS

Gilbert Regnier, Hatenay-Malabry; Roger Canevari, Villebon-sous-Yvette; Michel Laubie, Vaucresson, and Jean-Claude Poignant, Bures-sous-Yvette, all of France, assignors to Science-Union Et Cie, France

Filed Mar. 16, 1973, Ser. No. 342,284

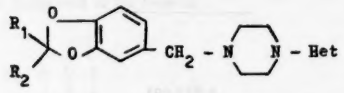
Claims priority, application United Kingdom, Apr. 7, 1972, 16098/72

Int. Cl.² C07D *405/14*

U.S. Cl. 260—256.4 N **3 Claims**

1. A compound selected from the group consisting of:

A. benzodioxole compounds of the general formula:



wherein:

R_1 is selected from the group consisting of hydrogen and alkyl having 1 to 5 carbon atoms inclusive;

R_2 is selected from the group consisting of alkyl having 1 to 5 carbon atoms inclusive, phenyl, halophenyl, lower-alkylphenyl, lower-alkoxyphenyl, and trifluoromethyl-phenyl, R_1 being alkyl when R_2 is alkyl;

R_1 and R_2 together represent a polymethylenic chain $—(CH_2)_n—$ wherein

n is selected from 4, 5 and 6; and

Het is pyrimidinyl, and

B. physiologically tolerable acid addition salts thereof.

3,917,598

N-(ORTHO-ALKOXY-PHENYL)-N'-ANILINO-PROPYL-PIPERAZINES

Isamu Maruyama, Minoo; Masaru Nakao, Osaka; Kikuo Sasajima, Toyonaka; Shigeho Inaba, Takakazuka, and Hisao Yamamoto, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

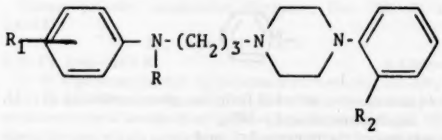
Filed Feb. 5, 1974, Ser. No. 439,827

Claims priority, application Japan, Feb. 5, 1973, 48-15025

Int. Cl.² C07D *295/12*

U.S. Cl. 260—268 PH **9 Claims**

1. A compound of the formula:



wherein R is hydrogen or ethyl, R_1 is fluorine, chlorine, methyl or methoxy and R_2 is C_1–C_3 alkoxy, or non-toxic pharmaceutically acceptable acid addition salts thereof.

3,917,599

2-SUBSTITUTED-1,2,3,4,6,7,12,12A-OCTAHYDROPYRAZINO(2',1':6,1)PYRIDO(3,4-B)INDOLES

Anil Kumar Saxena, Nainital; Padam Chand Jain; Gurbuksh Singh, both of Lucknow; Prithvi Raj Dua; Rikhab Chand Srimal, both of Lucknow; Bhola Nath Dhawan, and Nitya Anand, both of Lucknow, all of India, assignors to Council of Scientific and Industrial Research, New Delhi, India

Filed Mar. 30, 1973, Ser. No. 346,468

Int. Cl.² C07D *295/10*

U.S. Cl. 260—268 PC **8 Claims**

1. A compound which is a member of the group consisting of 2-ν-(p-fluorobenzoylpropyl)-1,2,3,4,6,7,12,12a-

octahydropyrazino[2',1':6,1]pyrido[3,4-b]indole; 2-ν-benzoylpropyl-1,2,3,4,6,7,12,12a-octahydropyrazino-[2',1':6,1] pyrido [3,4-b]indole; 2-β-(p-fluorobenzoylethyl)-1,2,3,4,6,7,12,12a-octahydropyrazino[2',1':6,1]pyrido-[3,4-b]indole; b 2-ν-(p-methoxybenzoylpropyl)-1,2,3,4,6,7,12,12a-octahydropyrazino[2',1':6,1]pyrido[3,4-b]indole; 2-ν-(p-fluorobenzoylpropyl)-6-methyl-1,2,3,4,6,7,12,12a-octahydropyrzino[2',1':6,1]pyrido[3,4-b]indole; 2-(3-oxobutyl)-1,2,3,4,6,7,12,12a-octahydropyrazino[2',1':6,1]-pyrido [3,4-b]indole and 2-(3-oxobutyl)-6-methyl-1,2,3,4,6,7,12,12a-octahydropyrazino[2',1':6,1]pyrido[3,4-b]indole.

3,917,600

2-(BENZOFURAN)-ACETAMIDINES

Marcel Descamps, Crainhem, and Alex Areschka, Brussels, both of Belgium, assignors to Labaz, Paris, France

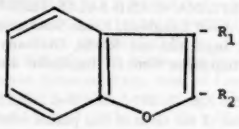
Filed Apr. 23, 1973, Ser. No. 353,482

Claims priority, application United Kingdom, May 2, 1972, 20436/72

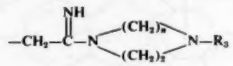
Int. Cl.² C07D *295/12, 295/18*

U.S. Cl. 260—268 BC **8 Claims**

1. A compound of the formula:



wherein R_1 and R_2, which are different, represent hydrogen, straight- or branched-chain lower alkyl having from 1 to 4 carbon atoms, or a radical of the formula:



wherein n is one of the integers 2 and 3, and R_3 represents, when n is 3, hydrogen or straight- or branched-chain lower alkyl having from 1 to 4 carbon atoms, or when n is 2, hydrogen, straight- or branched-chain lower alkyl having from 1 to 4 carbon atoms, lower hydroxyalkyl having 1-4 carbon atoms, carbethoxy, phenyl, chlorophenyl, fluorophenyl, trifluoromethylphenyl, benzyl, or pyridyl, or pharmaceutically acceptable acid addition salts thereof.

3,917,601

SULFOSUCCINATE DERIVATIVES AS DETERGENT BUILDERS

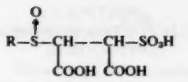
Vincent Lamberti, Upper Saddle River, N.J., assignor to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 394,613, Sept. 5, 1973, which is a division of Ser. No. 156,933, June 25, 1971, abandoned. This application July 1, 1974, Ser. No. 484,919

Int. Cl.² C07D *295/00;* **C07C** *143/16*

U.S. Cl. 260—247.1 E **1 Claim**

1. An α-alkylsulfinyl-β-sulfosuccinic acid having the general formula:



and the alkali metal, ammonium, monoethanolammonium, diethanolammonium, triethanolammonium, methylammonium, dimethylammonium, trimethylammonium, tetramethylammonium, morpholinium, N-methylmonoethanolammonium or N-ethylmonoethanolammonium salt thereof wherein R is an alkyl group containing 2–30 carbon atoms.

3,917,602

PREPARATION OF ALKALI METAL AMIDES

Henri Marie Normant, Paris, France, assignor to Rhone-Poulenc S.A., Paris, France

Continuation-in-part of Ser. No. 838,687, July 2, 1969, abandoned. This application Dec. 5, 1972, Ser. No. 312,273

Claims priority, application France, July 3, 1968, 68.157756

Int. Cl.² C07D *295/00*

U.S. Cl. 260—268 R **8 Claims**

1. In a process for preparing an alkali metal amide including reacting an alkali metal in the presence of hexamethylphosphotriamide, the improvement consisting essentially in using, as a reactant, benzene or an alkylbenzene, and reacting the alkali metal with ammonia or with an amine having at least one hydrogen atom bonded to an amine nitrogen atom, said benzene or alkylbenzene being reduced to the corresponding tetrahydro compound.

3,917,603

METHYL(9-METHYL-ACAIDAN-9-YL)-KETONES

Jacques Gosteli, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

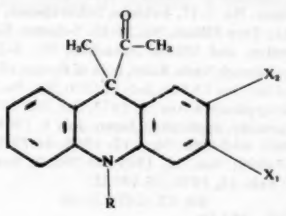
Division of Ser. No. 140,306, May 4, 1971, abandoned. This application Jan. 5, 1973, Ser. No. 321,183

Claims priority, application Switzerland, May 13, 1970, 7068/70

Int. Cl.² C07D *219/04*

U.S. Cl. 260—279 R **1 Claim**

1. Compounds having the formula



wherein R is hydrogen or methyl,

X_1 is hydrogen, chlorine, or trifluoromethyl, and

X_2 is hydrogen or, if X_1 is hydrogen, X_2 is hydrogen or chlorine.

3,917,604

PREPARATION OF DISPERSE METHINE DYE COMPOUNDS

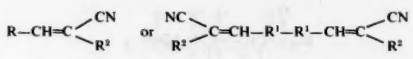
Vinton A. Hoyle, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 14, 1973, Ser. No. 341,218

Int. Cl.² C07D *215/18*

U.S. Cl. 260—283 CN **15 Claims**

1. Process for the preparation of a disperse methine dye compound having the formula



which comprises the steps of contacting in the presence of at least three mole equivalents of an acid acceptor per mole of $POCl_3$ a preformed anhydrous solution of an intermediate compound formed by contacting an amine having the formula H—R or —H—R^1—R^1—H with $POCl_3$ and a di-alkylformamide wherein the alkyl moiety is 1-4 carbons, with an active methylene compound having the formula NC—CH_2—R^2, wherein

R is a monovalent residue of an aniline, 1,2,3,4-tetrahydroquinoline or benzomorpholine component of a disperse methine dye compound attached to the group —CH=C(CN)R^2 by the aromatic carbon atom para to the nitrogen atom of said aniline, tetrahydroquinoline or benzomorpholine nucleus;

R^1 is a divalent residue of an aniline or 1,2,3,4-tetrahydroquinoline component of a disperse methine dye compound attached to the group —CH=C(CN)R^2 by the aromatic carbon atom para to the nitrogen atom of said aniline or tetrahydroquinoline nucleus; and

R^2 is cyano, alkoxycarbonyl of 2–5 carbons, alkanoyl of 2–5 carbons, phenyl carbonyl or phenyl carbonyl mono- or disubstituted with alkyl of 1–4 carbons, alkoxy of 1–4 carbons, Cl or Br, alkylsulfonyl of 1–4 carbons, phenylsulfonyl or phenylsulfonyl mono- or disubstituted with alkyl of 1–4 carbons, alkoxy of 1–4 carbons, Cl or Br, carboamoyl, N-alkylcarbamoyl or N,N-di-alkylcarbamoyl of 1–4 carbons in the alkyl moiety.

3,917,605

PROCESS FOR THE PREPARATION ON N-SUBSTITUTED 6,7-METHYLENEDIOXY-4-QUINOLONE DERIVATIVES

Takenari Nakagome, No. 111, 9-chome, Honmachi, Toyonaka; Hideo Ague, No. 9–17, 4-chome, Sakuragaoka, Minoo, both of Osaka; Toru Mitani, No. 28–16, 3-chome, Koshienguchi, Nishinomiya, and Mituso Nakashita, No. 4–22, 2-chome, Oishihgashimach Nada, Kobe, both of Hyogo, all of Japan

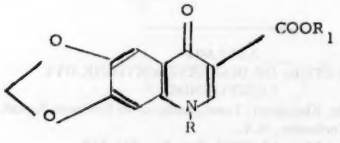
Division of Ser. No. 53,706, July 9, 1970, Pat. No. 3,761,482. This application Apr. 2, 1973, Ser. No. 347,029

Claims priority, application Japan, July 9, 1969, 44-54661; Oct. 2, 1969, 44-54890; Nov. 12, 1969, 44-79408; Nov. 12, 1969, 44-74909; Nov. 12, 1969, 44-79410; Nov. 12, 1969, 44-90957; Feb. 23, 1970, 45-15722

Int. Cl. G07d *33/48*

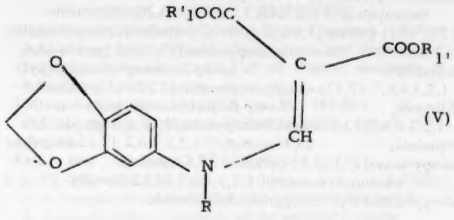
U.S. Cl. 260—283 SY **2 Claims**

1. A process for producing 1-substituted-6,7-methylenedioxy-4-quinolone-3-carboxylic acid compounds of the formula (I),



(I)

wherein R is C_{1-4} alkyl and R_1 is hydrogen or C_{1-4} alkyl which comprises the steps of reacting a dialkyl-N-substituted-3,4-methylenedioxyanilionmethylene-malonate of the formula (V),



(V)

wherein R is as defined above and R_1' is the same alkyl as defined in R_1, with a condensing agent capable of cyclizing said dialkyl-N-substituted-3,4-methylenedioxyanilinome thylenemalonate, said condensing agent being selected from the group consisting of polyphosphoric acid, polyphosphoric acid ester and mixtures thereof, at a temperature of 0° – 200°C. to yield one of the group consisting of a 1-substituted-6,7-methylenedioxy-4-quinolone-3-carboxylic acid compound of the above Formula (I) wherein said R_1 is hydrogen and a 1-substituted-6,7-methylenedioxy-4-quinolone-3-alkoxycarbonyl compound of the above formula (I) wherein said R_1 is said C_{1-4} alkyl.

3,917,606

N-THIENYLMETHYL-BENZOMORPHANS AND -MORPHINANS AND SALTS THEREOF

Herbert Merz; Adolf Langbein; Klaus Stockhaus, and Helmut Wick, all of Ingelheim am Rhein, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

Filed Apr. 2, 1973, Ser. No. 347,158

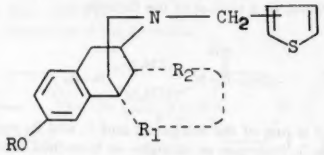
The portion of the term of this patent subsequent to July 9, 1991, has been disclaimed.

Claims priority, application Germany, Apr. 12, 1972, 2217420.

Int. Cl.² C07D *221/26, 221/28*

U.S. Cl. 260—285 **10 Claims**

1. A compound of the formula



wherein

R is hydrogen, methyl or acetyl, and

R_1 and R_2 are each hydrogen, methyl, ethyl, n-propyl or isopropyl, or, together with each other, 1,4-butylene,

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

3,917,607

BLOCK COPOLYMER ADHESIVE COMPOSITIONS

Ronald K. Crossland, Manhattan Beach, and James T. Harlan, Jr., Torrance, both of Calif., assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 182,870, Sept. 22, 1971, abandoned. This application Nov. 23, 1973, Ser. No. 418,716

Int. Cl.² C08L *91/08*

U.S. Cl. 260—28.5 B **6 Claims**

1. An adhesive composition comprising:

a. 100 parts by weight of a block copolymer having at least two polymer blocks A and at least one polymer block B,

each block A being a non-elastomeric polymer block of a monoalkenyl arene having an average molecular weight between about 2,000 and about 125,000 and each block B being an elastomeric hydrogenated polymer block of a conjugated diene, having an average molecular weight between about 10,000 and about 250,000;

b. 25–300 parts by weight of a tackifying resin being compatible predominantly with block B and substantially incompatible with block A of the block copolymer and selected from the group consisting of copolymers of 40–80 wt. % 1,3-pentadiene and 60–20 wt. % 2-methyl-2-butene, polyhydric esters of resin, polyhydric esters of hydrogenated resin, alphapinene resins, beta-pinene resins olefinic resins and synthetic polyterpenes;

c. 10–200 parts by weight of a predominantly aromatic second resin having a softening point above about 100°C, said second resin being compatible predominantly with block A and substantially incompatible with block B of the block copolymer and selected from the group consisting of coumarone-indene resins, vinyl toluene-alpha methyl styrene copolymers, alpha methyl styrene homopolymers, polyindene resins and polystyrene resins; and

d. 0–200 parts by weight of extending oil said oil being predominantly compatible with block B of the block copolymer.

3,917,608

SUBSTITUTED 6,7 DIHYDRO-1-OXO N(1H-TETRAZOL-5-YL)-1H,5H-BENZO[IJ]QUINOLIZINE CARBOXAMIDES

Gwynn Pennant Ellis, Cardiff, Wales; Heulwen Moira Ridgway, and David Edmund Bays, both of London, England, assignors to Allen & Hanburys Limited, London, England

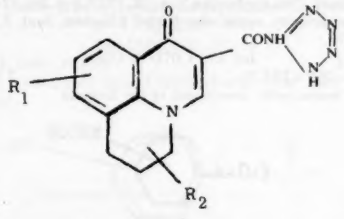
Filed Mar. 27, 1974, Ser. No. 455,071

Claims priority, application United Kingdom, Apr. 5, 1973, 16279/73

Int. Cl.² C07D *215/16*

U.S. Cl. 260—287 P **18 Claims**

1. Compounds of the formula (I):



(I)

and pharmaceutically acceptable salts thereof in which:

R_1 represents a hydrogen atom, an alkyl group, or the group OR_3, where R_3 is a hydrogen atom or an alkanoyl group, or an alkenyl group or an alkyl group which alkyl group may be substituted by alkylamino, dialkylamino, alkylbenzylamino, phenyl, benzyl, benzyloxy, alkanoyloxy, alkoxy, hyrdroxy, or tetrahydropyranyloxy groups; and up to 3 groups R_1; which may be the same or different are present; and R_2 represents hydrogen or an alkyl group, wherein alkyl when used above to define a single group or part of a group refers to a straight or branched chain alkyl group containing from 1 to 6 carbon atoms and the term alkenyl as defined above refers to a straight or branched chain alkenyl group containing from 3 to 6 carbon atoms and the term alkanoyl includes the formyl and the trifluoroacetoxy groups.

3,917,609

PYRROLOQUINOLINE CARBOXYLIC ACIDS AND DERIVATIVES

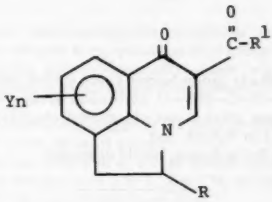
John F. Gerster, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed June 27, 1973, Ser. No. 373,980

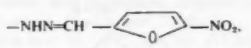
Int. Cl.² C07D *215/14*

U.S. Cl. 260—287 P **18 Claims**

1. A compound of the formula:



wherein R is methyl, ethyl, or hydrogen; Y is alkyl having 1 to 6 carbon atoms, alkoxy having 1 to 6 carbon atoms, halogen, hydroxy, nitro, cyano, trifluoromethyl, amino, alkanamido having 1 to 6 carbon atoms, or N-N-dialkylamino having 1 to 6 carbon atoms; *n* is zero, one or two, and when *n* is two, Y may be methylenedioxy (—OCH_2O—) or ethylenedioxy; and R^1 is —OH, OM^1 wherein M^1 is metal or ammonium, halide, —$NHNH_2$,



—OR^4 wherein R^4 is alkyl having 1 to 6 carbon atoms; or

wherein R^2 and R^3 are hydrogen or alkyl having 1 to 6 carbon atoms, or R^2 and R^3 taken together with the nitrogen atom to which they are attached are piperidino or pyrrolidino.

3,917,610

AMINO-IMIDAZO AND AMINO-PYRAZOLO-ISOQUINOLINES AND PROCESS FOR THE PREPARATION THEREOF

Kalman Takács, Budapest; Laszlo Szekeres, Szeged; Kalman Harsányi, Budapest; Gyula Papp, Szeged; Andras Neszmélyi, Budapest, and Éva Benedek, Gyor, all of Hungary, assignors to Chinoin Gyógyszer és Vegyészeti Termékek Gyára Rt., Budapest, Hungary

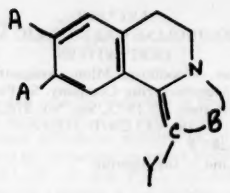
Filed July 2, 1973, Ser. No. 375,433

Claims priority, application Hungary, June 30, 1972, OE 10330

Int. Cl.² C07D *217/24*

U.S. Cl. 260—288 CF **19 Claims**

1. A compound of the following formula:



wherein

A is an alkoxy group having 1 to 4 carbon atoms;

B is a —N=C—NH—D carbamido group, wherein D is hydrogen, ethyl, acetyl, chloracetyl, phenylacetyl, benzyl, benzoyl or butyryl, and

Y stands for hydrogen, nitrile or methyl.

3,917,611

1,4-ETHANO-2,3 DIHYDROQUINOLINE DERIVATIVES

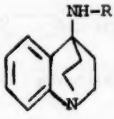
Daniel Farge, Thiais; Mayer Naoum Messer, Bievres, and Daniel Reisdorf, Thiais, all of France, assignors to Rhone-Poulenc, S.A., Paris, France

Filed July 30, 1973, Ser. No. 383,508

Claims priority, application France, Aug. 1, 1972, 72.27741

U.S. Cl. 260—288 R **2 Claims**

1. A 1,4-ethano-2,3-dihydroquinoline of the formula:



wherein R represents hydrogen or methyl, and pharmaceutically-acceptable non-toxic acid addition salts thereof.

3,917,612

1,1-DICHLORO-3-(4-PIPERIDINYL)PROPAN-2-OLS

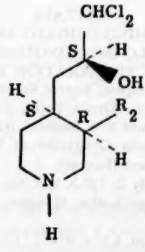
Guenter Grethe, North Caldwell, and Milan Radoje Uskokovic, Upper Montclair, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 166,583, July 27, 1971, Pat. No. 3,823,146, which is a continuation-in-part of Ser. No. 117,131, Feb. 19, 1971, abandoned, which is a continuation-in-part of Ser. No. 20,034, March 16, 1970, abandoned. This application May 2, 1974, Ser. No. 466,325

Int. Cl.[2] C07D *211/22*

U.S. Cl. 260—293.9 **14 Claims**

1. A compound of the formula



wherein R_2 is ethyl or vinyl, its enantiomers and racemate.

3,917,613

ESTERS OF MENTHOL AND 2-PYRROLIDONE OR PIPERIDINE CARBOXYLIC ACIDS

Francoise Ernestine Lucie Humbert, Paris, and Gerard Guth, Franconville, both of France, assignor to Lever Brothers Company, New York, N.Y.

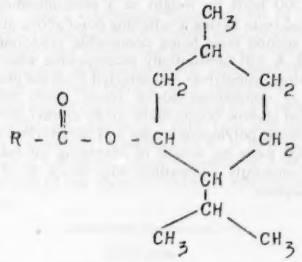
Filed July 30, 1973, Ser. No. 383,958

Claims priority, application United Kingdom, Aug. 7, 1972, 36802/72

Int. Cl. C07d *29/24*

U.S. Cl. 260—293.65 **5 Claims**

1. An ester of menthol and a heterocyclic carboxylic acid having the formula:



wherein R represents a radical derived by eliminating one H atom from the 3-, 4- or 5- position of 2- pyrrolidone or the 2-, 3- or 4- position of piperidine.

3,917,614

1-(PYRROLYLALKYL) PIPERIDINES

John Frederick Cavalla, Isleworth, and John Leheup Archibald, Windsor, both of England, assignors to John Wyeth & Brother Limited, Maidenhead, England

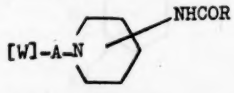
Continuation-in-part of Ser. No. 323,684, Jan. 15, 1973, which is a continuation-in-part of Ser. No. 175,345, Aug. 26, 1971, abandoned. This application Nov. 15, 1974, Ser. No. 524,161

Claims priority, application United Kingdom, Sept. 3, 1970, 42090/70

Int. Cl.[2] C07D *211/58*

U.S. Cl. 260—293.71 **3 Claims**

1. A heterocyclic compound of the formula



(I)

or a pharmaceutically acceptable acid addition salt thereof wherein W represents pyrrolyl or pyrrolyl substituted by lower alkyl and/or phenyl, A represents a lower alkylene radical of from 1 to 4 carbon atoms or a mono or diketo lower alkylene radical or a hydroxy-lower-alkylene radical of from 2 to 4 carbon atoms and R represents phenyl.

3,917,615

1,1-DIARYL-1-OXADIAZOL-ALKYLAMINES

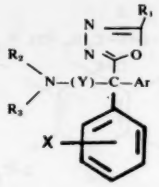
Gilbert W. Adelstein, Evanston, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Filed Apr. 1, 1974, Ser. No. 456,755

Int. Cl. C07d *85/54*

U.S. Cl. 260—293.54 **15 Claims**

1. A compound of the formula



and acid addition salts thereof wherein Y is alkylene containing 1–4 carbon atoms; R_1 is lower alkyl; X is hydrogen, halo or lower alkyl; Ar is phenyl, halo-substituted phenyl, lower alkyl substituted phenyl, or 2-pyridyl; and R_2 and R_3 are lower alkyl, or R_2 and R_3 together with N is a heterocyclic ring system consisting of azamonocyclic ring of the formula

wherein *n* is 0 or 1 and Z is oxygen, methylene, phenylhydroxymethylene, phenylcarboxymethylene, phenylcarbloweralkoxymethylene or azabicycloalkane containing 6 to 9 carbon atoms and containing at least 5 atoms in each ring of the azabicycloalkane.

3,917,616

SUBSTITUTED BENZYL-THIOLCARBAMIC ACID ESTERS

Akio Kudamatsu; Masao Miyamoto, and Nobuo Fukazawa, all of Tokyo, Japan, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 170,655, Aug. 10, 1971, Pat. No. 3,852,318, which is a continuation of Ser. No. 875,546, Nov. 10, 1969, abandoned. This application Feb. 21, 1974, Ser. No. 444,603

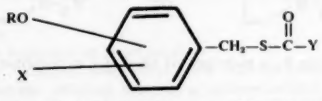
The portion of the term of this patent subsequent to Dec. 3, 1991, has been disclaimed.

Claims priority, application Japan, Nov. 12, 1968, 43-82249

Int. Cl.² C07D *295/16*

U.S. Cl. 260—293.73 **3 Claims**

1. A substituted benzyl-thiolcarbamic acid ester of the formula



in which R is alkyl of 1–4 carbon atoms, X is selected from the group consisting of chloro, bromo and alkyl of 1–4 carbon atoms, and Y is selected from the group consisting of pyrrolidino and piperidino.

3,917,617

1-[2,6-DIHYDROXY-4-HYDROCARBYL-BENZOYL]-POLYMETHYLENEIMINES AND DERIVATIVES

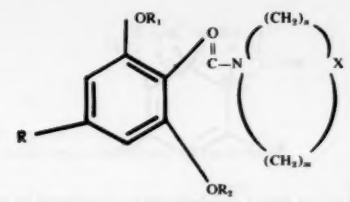
Raj Kumar Razdan, Belmont, and Harry George Pars, Lexington, both of Mass., assignors to Sharps Associates, Cambridge, Mass.

Filed Oct. 1, 1973, Ser. No. 402,480

Int. Cl.² C07D *295/16*

U.S. Cl. 260—293.77 **3 Claims**

1. A compound of the group consisting of compounds of the formula



and non-toxic pharmacologically acceptable acid addition salts thereof, wherein R represents an alkyl group having 1 to 20 carbon atoms, a phenyl-lower alkyl group, or a cycloalkyl-lower alkyl group in which the cycloalkyl moiety contains 3 to 8 carbon atoms;

R_1 and R_2 represent hydrogen or the same or different lower alkyl or lower alkanoyl groups;

m is an integer from 0 to 6, n is an integer from 0 to 6, $m + n$ is an integer from 3 to 6, X is CH_2 or CHR_3; and

R_3 is lower alkyl or phenyl-lower alkyl.

3,917,618

ε-(1-PIPERIDINO)THIOCARPROAMIDES

John Leheup Archibald, Windsor, and Adrian Charles Ward Curran, Reading, both of England, assignors to John Wyeth & Brother Limited, Maidenhead, England

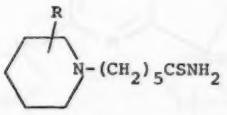
Filed June 20, 1973, Ser. No. 371,648

Claims priority, application United Kingdom, June 30, 1972, 30637/72

Int. Cl.² C07D *295/10*

U.S. Cl. 260—293.85 **5 Claims**

1. A compound selected from the group consisting of bases having the formula



wherein R is a member of the group consisting of hydrogen and methyl and the acid addition salts of said bases with pharmaceutically acceptable acids.

3,917,619

2-AMINO-4,5-DIHYDROPYRIDINE DERIVATIVES

Horst Meyer; Friedrich Bossert, both of Wuppertal-Elberfeld; Wulf Vater, Opladen, and Kurt Stoepel, Wuppertal-Vohwinkel, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

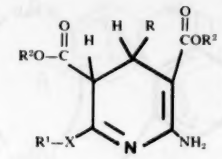
Division of Ser. No. 336,481, Feb. 28, 1973, Pat. No. 3,876,646. This application Mar. 21, 1974, Ser. No. 453,253

Claims priority, application Germany, Mar. 6, 1972, 2210650; Dec. 13, 1972, 2260860

Int. Cl.² C07D *213/55*

U.S. Cl. 260—294.8 D **5 Claims**

1. A compound of the formula:



wherein

R is furyl or thenyl unsubstituted or substituted by one or two members selected from the group consisting of lower alkyl, lower alkoxy and halogeno;

each of R^1 and R^2, taken independently of the other, is lower alkyl, alkenyl of 2 to 4 carbon atoms or alkynyl of 2 to 4 carbon atoms; and

X is oxygen or sulfur.

3,917,620

2-AMINO-4,5-DIHYDROPYRIDINE DERIVATIVES

Horst Meyer; Friedrich Bossert, both of Wuppertal-Elberfeld; Wulf Vater, Opladen, and Kurt Stoepel, Wuppertal-Vohwinkel, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

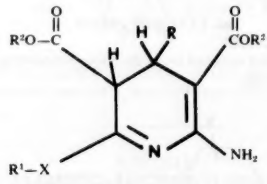
Division of Ser. No. 336,481, Feb. 28, 1973, Pat. No. 3,876,646. This application Mar. 21, 1974, Ser. No. 453,254

Claims priority, application Germany, Mar. 6, 1972, 2210650; Dec. 13, 1972, 2260860

Int. Cl.² C07D *213/55*

U.S. Cl. 260—294.8 G **7 Claims**

1. A compound of the formula:



wherein

R is pyridyl unsubstituted or substituted by one or two members selected from the group consisting of lower alkyl, lower alkoxy and halogeno;

each of R^1 and R^2, taken independently of the other, is lower alkyl, alkenyl of 2 to 4 carbon atoms or alkynyl of 2 to 4 carbon atoms; and

X is oxygen or sulfur.

3,917,621

PROCESS FOR PREPARING PHOSPHOROTHIOATES AND PHENYLPHOSPHONOTHIOATES

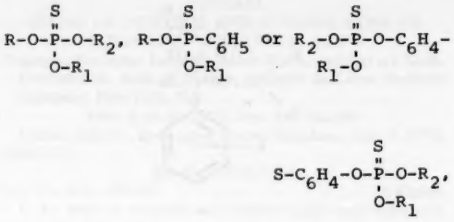
Lorraine M. Kroposki, Walnut Creek, Calif.; Masao Yoshimine, Midland, Mich., and Harold H. Freedman, Newton Center, Mass., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 229,171, Feb. 24, 1972, abandoned. This application Apr. 24, 1973, Ser. No. 354,040

Int. Cl.² C07D *213/83*

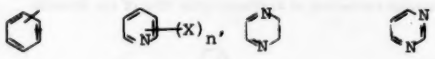
U.S. Cl. 260—294.8 K **19 Claims**

1. In the process of preparing a compound corresponding to the formula



wherein:

R_1 and R_2 are each independently lower alkyl; and R is



wherein:

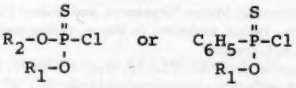
n is 0, 1, 2 or 3; and

X is nitro, cyano, halo, lower alkyl, lower alkoxy, lower alkylthio or lower alkylsulfinyl,

with the proviso that R does not bear more than one nitro group, lower alkylthio group or lower alkylsulfinyl group; by reacting in an inert liquid reaction medium under neutral or alkaline conditions (a) a compound corresponding to the formula

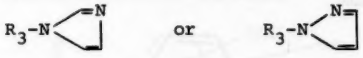
$$R—O^-M^+ \text{ or } M^+O^-—C_6H_4—S—C_6H_4—O^-M^+$$

with (b) a compound corresponding to the formula



wherein M is an alkali metal and R, R_1 and R_2 have the aforesaid meaning;

the improvement consisting of conducting the process in the presence of a small but catalytic amount of (1) a quaternary ammonium salt having a minimum solubility of at least 1 weight percent in the liquid reaction medium at 25°C. and (2) a diazole corresponding to the formula



wherein R_3 is hydrogen or alkyl of 1 to 6 carbon atoms.

3,917,622

2-AMINO-1,4-DIHYDROPYRIDINE DERIVATIVES

Horst Meyer; Friedrich Bossert, both of Wuppertal-Elberfeld; Wulf Vater, Opladen, and Kurt Stoepel, Wuppertal-Elberfeld, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

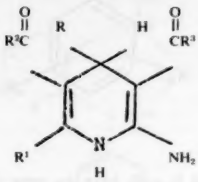
Division of Ser. No. 336,639, Feb. 28, 1973, Pat. No. 3,867,393. This application Mar. 27, 1974, Ser. No. 455,306

Claims priority, application Germany, Mar. 6, 1972, 2210674

Int. Cl.² C07D *213/50*

U.S. Cl. 260—294.8 F **4 Claims**

1. A compound of the formula:



wherein

R is hydrogen; lower alkyl; alkenyl alkenyl of two to four carbon atoms; alkynyl of two to four carbon atoms; phenyl; phenyl substituted by lower alkyl, lower alkoxy, halogeno, nitro, cyano, trifluoromethyl, azido, carbo(lower alkoxy), lower alkylsulfonyl, lower alkylsulfinyl, lower alkylthio, phenyl, di-methoxy, tri-methoxy, nitro and chloro, trifluoromethyl and nitro, nitro and methoxy, cyano and methyl, nitro and di-methoxy or di-methoxy and bromo; or naphthyl;

R^1 is hydrogen, lower alkyl, phenyl or pyridyl;

R^2 is lower alkyl; and

R^3 is lower alkyl.

3,917,623

DIHYDRO-3-(-1-PHENETHYL)1,2,3,6-TETRAHYDRO-4-PYRIDYL)-2(3H) FURANONES

Bruno Hügi, Aesch; Gunter Rentsch, Munchenstein, and Erwin Rissi, Basel, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

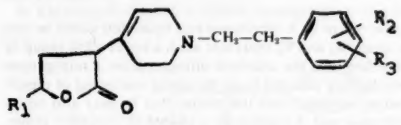
Filed Sept. 6, 1974, Ser. No. 503,969

Claims priority, application Switzerland, Sept. 11, 1973, 13023/73

Int. Cl.² C07D *405/06;* **A61K** *31/44*

U.S. Cl. 260—294.8 G **21 Claims**

1. A compound of the formula



wherein

R_1 is hydrogen or lower alkyl,

R_2 is hydrogen, lower alkyl, lower alkoxy, lower alkylthio, fluorine, chlorine, bromine or trifluoromethyl, and

R_3 is hydrogen, chlorine, lower alkyl or lower alkoxy,

or a pharmaceutically acceptable acid addition salt thereof.

3,917,624

PROCESS FOR PRODUCING 2-AMINO-NICOTINONITRILE INTERMEDIATES

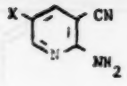
Marwan J. Abu El-Haj, Gales Ferry, and Beryl William Dominy, Groton, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 292,645, Sept. 27, 1972, Pat. No. 3,862,191. This application Sept. 23, 1974, Ser. No. 508,059

Int. Cl.² C07D *213/57*

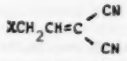
U.S. Cl. 260—294.9 **7 Claims**

1. The process for preparing 2-aminonicotinonitriles of the formula:



which process comprises:

1. contacting a compound of the formula



wherein X is alkyl containing from 1 to 4 carbon atoms, with equimolar proportions of a trialkyl orthoformate wherein said alkyl contains from 1 to 4 carbon atoms, in the presence of at least two molar equivalents of an alkanoic acid anhydride wherein said alkanoic acid contains from 2 to 4 carbon atoms at 75°–175° C.; and

2. thereafter, contacting the intermediate 1-alkoxy-2-alkyl-4,4-dicyano-1,3-butadiene product with equimolar proportions of ammonia at 25°–150°C.

3,917,625

SALICYLAMIDES AND COMPOSITIONS THEREOF

Richard Martin Lee, Ickleford, and George Sidney Sach, Welwyn, both of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

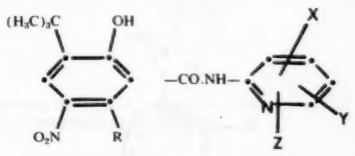
Filed Nov. 12, 1973, Ser. No. 415,205

Claims priority, application United Kingdom, Dec. 6, 1972, 56234/72

Int. Cl.² C07D *213/61*

U.S. Cl. 260—295 AM **14 Claims**

1. A compound of the formula:



wherein R is hydrogen or lower alkyl; and X, Y and Z, which may be the same or different, are hydrogen, halogen, lower alkyl, lower alkoxy, nitro or carbalkoxy; provided that X, Y and Z are not simultaneously all hydrogen.

3,917,626

3,6-DIOXA-1,8-OCTANDIAMIDO BIS (PYRIDINIUM) COMPOUNDS

Philip Neil Edwards, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England

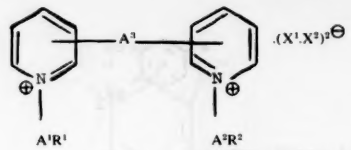
Division of Ser. No. 234,648, March 14, 1972, Pat. No. 3,786,058. This application Dec. 27, 1973, Ser. No. 428,694

Claims priority, application United Kingdom, Mar. 29, 1971, 8071/71

Int. Cl.² C07D *31/28*

U.S. Cl. 260—295.5 A **4 Claims**

1. A pyridine derivative of the formula:



wherein R^1 and R^2 which may be the same or different are each alkyl having 8 to 14 carbon atoms, n-undec-10-yl, 2-n-hexyloxyethyl, 2-(2-butoxyethoxy)-ethyl, 3,4-dichlorophenyl, 4-chlorobenzyl, 2,4-dichlorobenzyl or 2-naphthylmethyl; A^1 and A^2 are each a direct linkage or a linking group of the formula $-CH_2CO{\cdot}NH-$ wherein the methylene is joined to the pyridine nitrogen; $(X^1 \cdot X^2)^{2-}$ represents two monoanions or a dianion selected from the group consisting of two halide, methanesulphonate, toluene-p-sulphonate or acetate ions or the sulphate dianion; and A^3 is a linking group of the formula: $-NH{\cdot}CO(CH_2OCH_2)_2\,CO{\cdot}NH-$.

3,917,627

6-SUBSTITUTED 4H-IMIDAZO[1,2-A][1,4]BENZODIAZEPINES AND PROCESS FOR THEIR PRODUCTION

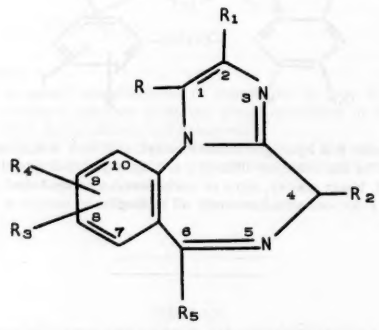
Jackson B. Hester, Jr., Galesburg, Mich., and Arthur R. Hanze, deceased, Late of Kalamazoo, Mich. (by Janice W. Hanze, administratrix), assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 169,091, Aug. 4, 1971, abandoned. This application Sept. 10, 1973, Ser. No. 395,511

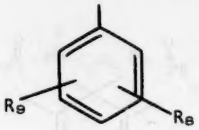
Int. Cl.[2] C07D *243/20*

U.S. Cl. 260—296 T **14 Claims**

1. A compound of the formula



wherein R is selected from the group consisting of hydrogen, methyl, ethyl and propyl; R_1 is selected from the group consisting of hydrogen and alkyl of 1 to 3 carbon atoms, inclusive; R_2 is selected from the group consisting of hydrogen, alkyl of 1 to 3 carbon atoms, inclusive, hydroxy, acetoxy and propionoxy; R_3 and R_4 are each selected from the group consisting of hydrogen, halogen, nitro, trifluoromethyl, alkylthio in which the alkyl moiety contains from 1 to 3 carbon atoms, inclusive; and R_5 is selected from the group consisting of pyridyl and a phenyl radical of the formula



in which R_8 and R_9 each have the same meanings as given above for R_3 and R_4, and the pharmacologically acceptable acid addition salts thereof.

3,917,628

NEW DERIVATIVES OF 1,4-BENZODIOXAN, THE PREPARATION AND THE USE THEREOF

Pierre M. Vanhoof, and Pierre M. Clarebout, both of Brussels, Belgium, assignors to A. Christiaens, Societe Anonyme, Brussels, Belgium

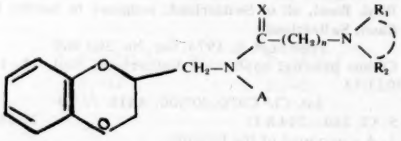
Filed Sept. 25, 1973, Ser. No. 400,605

Claims priority, application United Kingdom, Sept. 26, 1972, 44435/72

Int. Cl.[2] C07D *211/26, 213/46*

U.S. Cl. 260—296 B **11 Claims**

1. A derivative of 1,4-benzodioxan of the general formula:



in which $n = 1$ or 2, X represents two hydrogen atoms or one oxygen atom, R_1 and R_2 represent each a lower alkyl group or form together with the attached nitrogen atom a nitrogenous heterocyclic ring selected from the group consisting of piperidino and pyrrolidino, with the priviso that R_1 may also represent hydrogen and A represents a phenyl or 2-pyridyl group, or a pharmaceutically acceptable acid addition salt of said compound of formula (I).

3,917,629

CERTAIN 2-OXY-5-PHENYL-6-AZA-7-CHLORO-1,2-DIHYDRO-3H-1,4-BENZODIAZEPINES

Walter Von Bebenburg, Buchschlag, and Heribert Offermanns, Grossauheim, both of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler, Germany

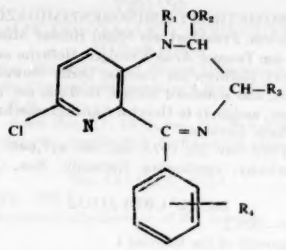
Filed Apr. 22, 1974, Ser. No. 463,129

Claims priority, application Austria, May 8, 1973, 4028/73

Int. Cl.[2] C07D *243/06*

U.S. Cl. 260—296 H **12 Claims**

1. A 6-aza-1,2-dihydro-3H-1,4-benzodiazepine of the formula:



wherein:

R_1 is hydrogen, lower alkyl, lower alkenyl, cycloalkyl, hydroxy lower alkyl, lower alkoxy lower alkyl, amino lower alkyl, mono lower alkyl aminoalkyl, di-lower alkylamino lower alkyl;

R_2 is hydrogen, lower alkyl or lower alkoxy lower alkyl;

R_3 is hydrogen, lower alkyl or lower alkoxy;

R_4 is hydrogen or halogen, or a pharmaceutically acceptable salt thereof.

3,917,630

HETEROCYCLIC COMPOUNDS

Heinz Hambock, Binningen; Elmar Sturm, Arlesheim, and Anton Georg Weiss, Benken, Basel-Land, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

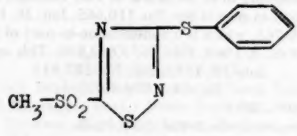
Filed Aug. 28, 1972, Ser. No. 284,199

Claims priority, application Switzerland, Aug. 31, 1971, 12795/71

Int. Cl. C07d *91/60*

U.S. Cl. 260—302 SD **3 Claims**

1. Thiadiazole derivative which corresponds to the formula



3,917,631

PROCESS FOR PREPARING SUBSTITUTED OXAZOLINES

Dieter Arlt, Cologne, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

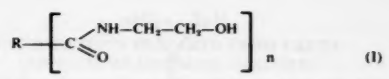
Filed Oct. 31, 1972, Ser. No. 302,438

Claims priority, application Germany, Nov. 9, 1971, 2155492

Int. Cl.² C07D *263/10*

U.S. Cl. 260—307 F **7 Claims**

1. Process for preparing for 2-substituted Δ^2-oxazolines unsubstituted in the 4- and 5-positions which comprises reacting an N-(2-hydroxyethyl)-carboxylic acid amide having the formula:



(I)

wherein

n is 2 or 3; and

R is an aromatic radical selected from the group of phenyl, naphthyl, anthranyl and phenanthrenyl and the foregoing substituted with a substituent selected from the group of halogen, hydroxy, nitro, alkyl with 1-8 carbon atoms, alkoxy having from 1–8 carbon atoms, alkyl-carbonyl having 1–8 carbon atoms in the alkyl portion and alkoxy-carbonyl having 1–8 carbon atoms in the alkyl portion and the radical —NHR′ where R′ is hydrogen, alkyl having 1-18 carbon atoms or phenyl with oleum at a temperature in the range of from 50°C to 150°C, and thereafter neutralizing the resulting reaction mixture.

3,917,632

5-AMINO ISOXAZOLE FROM 3-AMINO ACRYLONITRILE

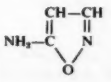
Willy Leimgruber, Montclair, and Manfred Weigele, North Caldwell, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 262,880, June 14, 1972, Pat. No. 3,810,935, which is a division of Ser. No. 42,545, June 1, 1970, Pat. No. 3,709,922. This application Jan. 23, 1974, Ser. No. 435,918

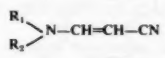
Int. Cl.² C07D *261/14*

U.S. Cl. 260—307 H **2 Claims**

1. A process for producing a compound of the formula



comprising the step of reacting at a temperature of 10°C to 90°C, a compound of the formula



wherein R_1 and R_2 are lower alkyl with a hydrohalic or sulfuric acid addition salt of hydroxylamine in the presence of an aprotic solvent.

3,917,633

9-[3-(DIMETHYLAMINO)-PROPYLIDENE]-9H-DIBENZO[C,F]-IMIDAZOL[1,2-A]AZEPINES

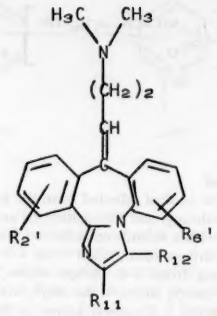
Martin Gall, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Dec. 14, 1973, Ser. No. 424,666

Int. Cl.² C07D *223/16*

U.S. Cl. 260—309 **4 Claims**

1. A compound according to claim 1 of the formula:



wherein R_2' and R_8' are selected from the group of hydrogen and chlorine, and wherein R_{11} and R_{12} are selected from the group consisting of hydrogen and alkyl of one to three carbon atoms, inclusive.

3,917,634

1-(2,6-DIMETHYL-2-OCTEN-8-YL)-2-SUBSTITUTED OR UNSUBSTITUTED PHENYLIMIDAZOLES

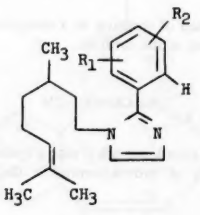
William J. Houlihan, Mountain Lakes, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed Nov. 9, 1973, Ser. No. 414,366

Int. Cl.[2] C07D *233/58*

U.S. Cl. 260—309 **6 Claims**

1. A compound of the formula



where

R_1 and R_2 each independently represent hydrogen, halo having an atomic weight of about 19 to 36, straight chain lower alkyl having one to four carbon atoms, lower alkoxy having one to four carbon atoms, trifluoromethyl, or R_1 and R_2 on adjacent carbon atoms together represent methylenedioxy,

provided that when R_1 and R_2 are both trifluoromethyl they are on other than adjacent carbon atoms;

or a pharmaceutically acceptable acid addition salt thereof.

3,917,635

2-CARBOMETHOXY-AMINOBENZIMIDAZOLES

Gerhard Horlein, Frankfurt am Main; Hilmar Mildenberger, Kelkheim am Taunus; Arno Kroniger, Hofheim am Taunus; Kurt Hartel, Hofheim am Taunus; Dieter Duwel, Hofheim am Taunus, and Reinhard Kirsch, Hofheim am Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

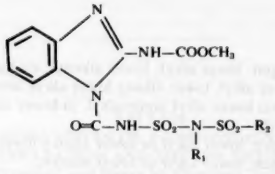
Filed Nov. 20, 1973, Ser. No. 417,640

Claims priority, application Germany, Nov. 22, 1972, 2257184

Int. Cl.[2] C07D *235/32*

U.S. Cl. 260—309.2 **8 Claims**

1. A compound of the formula I



(I)

where R_1 is alkyl having from one to 12 carbon atoms or cycloalkyl having from four to eight carbon atoms and R_2 is alkyl having from one to 12 carbon atoms; halo-alkyl having from one to 20 carbon atoms; cycloalkyl having from five to eight carbon atoms; phenyl, benzyl or naphthyl phenyl, benzyl or naphthyl being mono or di substituted by halogen, alkyl having from one to four carbon atoms or alkoxy having from one to four carbon atoms, cyano and/or nitro.

3,917,636

N-(2-(NITRO-1-IMIDAZOLYL)ETHYL)IMIDES

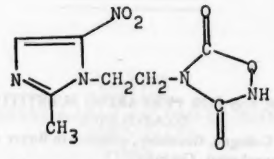
John W. Cusic, Skokie, and Ernest F. Levon, Evanston, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Continuation-in-part of Ser. No. 110,665, Jan. 28, 1971, Pat. No. 3,770,763, which is a continuation-in-part of Ser. No. 796,225, Feb. 3, 1969, Pat. No. 3,642,836. This application July 30, 1973, Ser. No. 383,911

Int. Cl. C07d *49/32*

U.S. Cl. 260—309.5 **4 Claims**

1. A compound which has the formula



wherein Q is selected from the group consisting of cycloalkylidene containing 5 to 7 carbon atoms, adamantylidene and

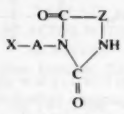
wherein R' and R'' are selected from the group consisting of lower alkyl and phenyl.

3,917,637
N-HALOGENOOXAALKYL DERIVATIVES OF HYDANTOINS

Daniel Porret, Binningen, and Jürgen Habermeier, Pfeffingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 27, 1973, Ser. No. 419,314
Claims priority, application Switzerland, Dec. 12, 1972, 18029/72
Int. Cl.² C07D *49/34*
U.S. Cl. 260—309.5 **6 Claims**

1. A halogenoalkylhydantoin of the formula



wherein
Z denotes methylene optionally substituted with alkyl of one to six carbon atoms or Z denotes cycloalkylidene of five to six carbon atoms,
A denotes lower oxaalkylene, and
X denotes chlorine or bromine.

3,917,638
1,3-DIACYL DERIVATIVES OF IMIDAZOLIDINE

Robert R. Mod; Frank C. Magne; Gene Sumrell, all of New Orleans; Arthur F. Novak, Baton Rouge, all of La., and James M. Solar, Lubbock, Tex., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 154,698, June 18, 1971, abandoned. This application Mar. 4, 1974, Ser. No. 448,427
Int. Cl.² C07D *49/34*
U.S. Cl. 260—309.7 **10 Claims**

1. 1,3-Dibutyrylimidazolidine.
10. 1,3-Dioleoylimidazolidine.

3,917,639
DISPERSING AGENTS

Hugh Patrick Dryhurst Paget; Leslie Richard Rogers; James Kenneth Davenport Royle; James Frederick Stansfield, and Arthur Topham, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 219,843, Jan. 21, 1972, abandoned. This application Jan. 14, 1974, Ser. No. 432,993
Int. Cl.² C09B *47/04*
U.S. Cl. 260—314.5 **2 Claims**

1. A dyestuff selected from the classes of dyestuff represented by the formulae $-X-O_yH]_n$ and $D-Z-O-OC-X-O_yCOT]_n$ wherein D is a radical of copper phthalocyanine which is attached to Z through a carbon atom on one of the benzene rings present in D; *n* is a positive integer from one to eight inclusive; Z is a divalent bridging group from the series $-CH_2-$, $-NHCH_2CH_2-$, $-NHCH_2CHOHCH_2-$, $-NHCOCH_2-$, $-SO_2NHCH_2CH_2-$ and $-SO_2-NR^1-CH_2CHOHCH_2$ where R^1 is selected from the group H, lower alkyl, phenyl and lower alkyl substituted phenyl; X is alkylene or alkenylene containing at least eight carbon atoms and in which there are at least four carbon atoms between the —CO— and —O— groups; T is alkyl or alkenyl containing from 8–20 carbon atoms and y is a positive integer in the range 2–20 inclusive.

3,917,640
VAT DYESTUFFS PREPARED FROM CRUDE AMINOANTHRAQUINONE MIXTURES

Joseph William Fitzpatrick, and Harold Norbert Schmidt, both of Toms River, N.J., assignors to Toms River Chemical Corporation, Toms River, N.J.

Filed Mar. 30, 1973, Ser. No. 346,544
Int. Cl.² C07D *209/88*
U.S. Cl. 260—316 **6 Claims**

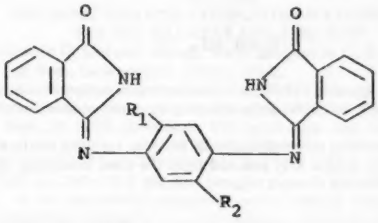
2. The vat dyestuff obtained by reacting the mixture of anthraquinones consisting substantially of
65– 80% 1-aminoanthraquinone and correspondingly
20– 35% of a mixture comprising 2-aminoanthraquinone, 1,5-diaminoanthraquinone and 1,8-diaminoanthraquinone with a halogenated anthraquinone and thereafter effecting ring closure.

3,917,641
IMINOISOINDOLINONES

Peter Bitterli, Reinach, Basel-Land, and Fritz Kehrer, Basel, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed May 7, 1973, Ser. No. 358,003
Claims priority, application Switzerland, May 8, 1972, 6814/72
Int. Cl.² C08D *209/50;* **C09D** *3/727, 11/00;* **C08J** *3/20*
U.S. Cl. 260—325 **4 Claims**

1. A compound of formula I,



I

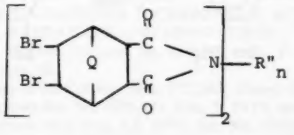
in which R_1 and R_2, which may be the same or different, each signifies a chlorine atom, a bromine atom, a methyl group, a methoxy group or an ethoxy group.

3,917,642
BROMINATED TRICYCLIC IMIDE FLAME RETARDANTS

Lionel T. Wolford; Jack Newcombe, both of Freehold, and Anderson O. Dotson, Jr., Somerset, all of N.J., assignors to Cities Service Company, Tulsa, Okla.

Continuation-in-part of Ser. No. 200,615, Nov. 19, 1971, abandoned. This application May 11, 1973, Ser. No. 359,283
Int. Cl.² C07D *209/76, 405/14*
U.S. Cl. 260—326 C **6 Claims**

1. A compound corresponding to the formula:



wherein Q is methylene or oxygen; R'' is methylene, ethylene, vinylene, 1,2-dibromoethylene, propylene, 2,3-dibromobutylene, cyclohexylene, bromocyclohexylene, 2,3-dibromocyclohexylene, cyclohexenylene, dodecylene, 4,4'-methylene-

dicyclohexylene, phenylene, bromophenylene, toluylene, bromotoluylene, xylylene, or bromoxylylene; and *n* is 0 or 1; said compound having a bromine content of at least about 35% by weight.

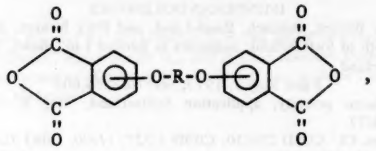
3,917,643

METHOD FOR MAKING POLYETHERIMIDES AND PRODUCTS PRODUCED THEREBY

Tohru Takekoshi, Scotia, N.Y., and John E. Kochanowski, Pittsfield, Mass., assignors to General Electric Company, Schenectady, N.Y.

Filed June 22, 1973, Ser. No. 372,769
Int. Cl.[2] C07D *209/34*
U.S. Cl. 260—326 R **6 Claims**

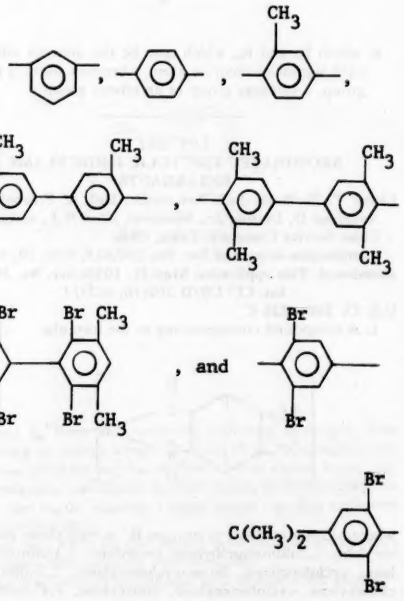
1. A method for making a polyetherimide, which comprises, 1. effecting reaction between aromatic bis(ether anhydride) of the formula,



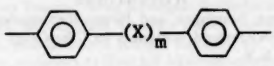
and organic diamine of the formula,

in the presence of a phenolic solvent at temperatures between about 100°C to 250°C while effecting the removal of water of reaction,

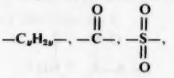
2. separating said poletherimide from the resulting mixture of (1), where R is selected from the class consisting of a. the following divalent organic radicals,



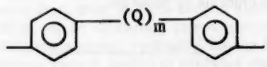
and (b) divalent organic radicals of the general formula



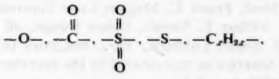
where X is a member selected from the class consisting of divalent radicals of the formulas



-O-, and -S-, where *m* is 0 or 1, y is a whole number from 1 to 5, and R^1 is a divalent organo radical selected from the class consisting of (a) aromatic hydrocarbon radicals having from 6–20 carbon atoms and halogenated derivatives thereof, (b) alkylene radicals, $C_{(x-n)}$ alkylene terminated polydiorganosiloxane cycloalkylene radicals having from 2–20 carbon atoms, and (c) divalent radicals included by the formula,



where Q is a member selected from the class consisting of



and *x* is a whole number from 1 to 5 inclusive, and *m* is as previously defined.

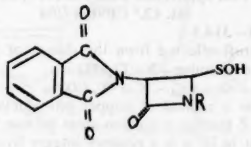
3,917,644

AZETIDINESULFENIC ACIDS

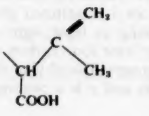
Ta-Sen Chou, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Aug. 3, 1973, Ser. No. 385,369
Int. Cl.[2] C07D *209/34*
U.S. Cl. 260—326 S **9 Claims**

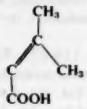
1. A compound of the formula



in which R is



or



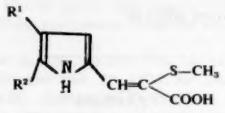
3,917,645

PYRROLYACRYLIC ACIDS WITH HYPOGLYCEMIC ACTIVITY

Thomas H. Althuis, New London, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Dec. 26, 1972, Ser. No. 318,666
Int. Cl.[2] C07D 207/32
U.S. Cl. 260—326.2 3 Claims

1. A compound selected from those of the formula



and the ethyl esters and sodium salts thereof, wherein
R^1 is H or methyl, and
R^2 is H, lower alkyl, phenyl or monosubstituted phenyl, whose monosubstituent is methyl, methoxy or chloro.

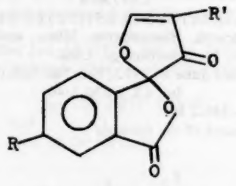
3,917,646

4-LOWER ALKYL OR ARYL SUBSTITUTED-SPIRO[FURAN-2(3H),1'-PHTHALAN]-3,3'-DIONES AS FLUOROMETRIC REAGENTS

Willy Leimgruber, Montclair, and Manfred Weigele, North Caldwell, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 212,790, Dec. 27, 1971, Pat. No. 3,812,181. This application Mar. 4, 1974, Ser. No. 447,711
Int. Cl.[2] C07D 209/18, 307/88, 317/50
U.S. Cl. 260—326.13 R 19 Claims

1. A compound of the formula



wherein R is hydrogen, halogen, lower alkyl or lower alkoxy and R' is lower alkyl or a radical selected from the group consisting of phenyl, naphthyl, furyl, thienyl, pyrrolyl, imidazolyl, pyridyl, pyrimidinyl, indolyl, quinolyl, oxazolyl and isoxazolyl, which radical may be unsubstituted or substituted with one or more halogen, lower alkyl, lower alkoxy, nitro or cyano groups.

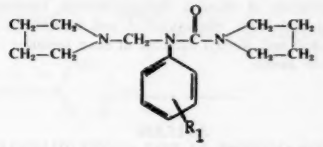
3,917,647

HERBICIDAL COMPOSITIONS

Alexander Mihailovski, Berkeley, Canada, assignor to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 247,670, April 26, 1972, abandoned, which is a division of Ser. No. 99,658, Dec. 18, 1970, abandoned. This application Jan. 4, 1974, Ser. No. 430,809
Int. Cl.[2] C07D 295/20
U.S. Cl. 260—326.25 5 Claims

1. A compound of the formula:



wherein R_1 is selected from 3,5-Cl, 3-CF_3, 3-Cl and 4-Cl.

3,917,648

GALVANIC COATING COMPOSITIONS COMPRISING POLYOL SILCATES AND ZINC DUST

Gordon D. McLeod, Adrian, Mich., assignor to G. D. McLeod & Sons, Incorporated, Adrian, Mich.

Continuation-in-part of Ser. No. 107,578, Jan. 18, 1971, abandoned, which is a continuation-in-part of Ser. No. 75,306, Sept. 24, 1970, abandoned. This application Aug. 28, 1972, Ser. No. 283,964
Int. Cl.[2] C08L 83/00; C08K 5/07
U.S. Cl. 260—32.8 SB 44 Claims

1. An essentially anhydrous polyol silicate composition consisting essentially of solvent-soluble, polyol silicate ester-exchange reaction product of (1) silicate consisting essentially of a member selected from the group consisting of ortho silicates having esterexchangeable groups of 1 to 6 carbon atoms selected from the group consisting of alkyl, hydroxyalkyl, alkoxyalkyl and hydroxyalkoxyalkyl, siloxanes thereof and their mixtures, and (2) aliphatic polyol which is ester-exchangeable with (1) said reaction product being made by reacting (1) and (2) in amounts providing a ratio of hydroxyl groups of (2) of about 0.15 to 1.8 moles per mole of ester-exchangeable group of (1); and finely divided metallic zinc in an amount sufficient to provide galvanic protection when the composition is cured on a ferrous substrate.

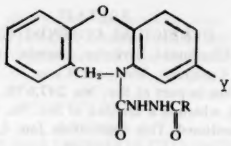
3,917,649

DIBENZOXAZEPINE N-CARBOXYLIC ACID HYDRAZIDES AND DERIVATIVES

Richard A. Mueller, Glencoe, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Continuation-in-part of Ser. Nos. 127,360, March 23, 1971, abandoned, and Ser. No. 329,407, Feb. 5, 1973, abandoned. This application Aug. 12, 1974, Ser. No. 496,692
Claims priority, application Australia, Mar. 22, 1972, 40272/72
Int. Cl.[2] C07D 267/20
U.S. Cl. 260—333 10 Claims

1. A compound of the formula



wherein Y is selected from the group consisting of halogen and trifluoromethyl radicals, R is a radical selected from the group consisting of alkenyl, carboxyalkenyl, carboxyalkyl, cyanoalkyl, haloalkyl, phenoxyalkyl and halophenoxyalkyl, and the alkyl and alkenyl radicals in each instance contain 1–12 carbon atoms.

3,917,650

((9-OXOXANTHENE-2,6-DIYL)DIOXY)DIACETONITRILES AND DIACETAMIDOXIME

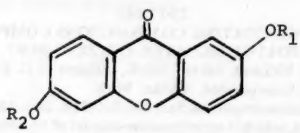
Arthur A. Santilli, Havertown, and Anthony C. Scotese, King of Prussia, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed May 8, 1974, Ser. No. 468,055

Int. Cl.[2] C07D *311/88*

U.S. Cl. 260—335 **2 Claims**

1. A compound selected from those having the formula



where R_1 and R_2 are acetamidoxime; and their pharmaceutically acceptable addition salts.

3,917,651

DIOXATRICYCLODECANONES

Peter Willibrord Thies, Hannover, Germany, assignor to Kali-Chemie AG, Hannover, Germany

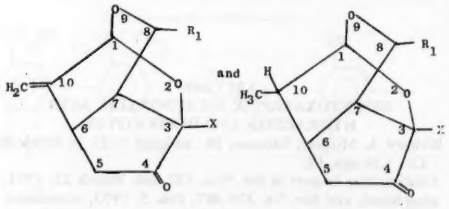
Division of Ser. No. 97,420, Dec. 7, 1970, Pat. No. 3,812,154. This application Jan. 24, 1974, Ser. No. 436,382

Claims priority, application Germany, Dec. 8, 1969, 1961433; Dec. 13, 1969, 1962624; June 6, 1970, 2027890

Int. Cl.[2] C07D *319/08*

U.S. Cl. 260—340.3 **7 Claims**

1. A compound of the group consisting of 2,9-dioxatricyclo[4.3.1.$0^{3,7}$]decan-4-ones having the formulae



in each of which formulae R_1 is a radical of the group consisting of alkoxy radicals having up to 4 carbon atoms and the benzyloxy radical, and X is a radical of the group consisting of methyl and chloromethyl radicals.

3,917,652

JUVABIONE AND DERIVATIVES THEREOF

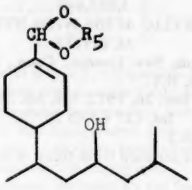
Beverly Ann Pawson, Montclair, and Gabriel Saucy, Essex Fells, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 118,971, Feb. 25, 1971, Pat. No. 3,824,291, which is a continuation-in-part of Ser. No. 803,964, March 3, 1969, Pat. No. 3,641,156, which is a continuation-in-part of Ser. No. 725,208, April 29, 1968, abandoned. This application July 12, 1973, Ser. No. 378,454

Int. Cl.[2] C07D *317/20, 319/06*

U.S. Cl. 260—340.9 **3 Claims**

1. A compound of the formula:



wherein R_5 is lower alkylene.

3,917,653

N,N-DISUBSTITUTED HYDROXYLAMINES

Atsuaki Arai, and Mitsugu Tanaka, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

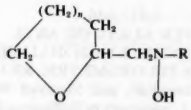
Filed Dec. 26, 1973, Ser. No. 428,574

Claims priority, application Japan, Dec. 25, 1972, 48-260

Int. Cl.[2] C07D *307/14, 309/06*

U.S. Cl. 260—345.1 **6 Claims**

1. An N,N-disubstituted hydroxylamine represented by the following formula (I):



(I)

wherein R represents alkyl, hydroxyalkyl, alkoxyalkyl, alkoxyalkoxyalkyl, alkeny or tetrahydrofurufuryl, n is 1 or 2, and wherein said R has 1 to 8 carbon atoms.

3,917,654

ANTI-INFLAMMATORY SUBSTITUTED BENZOFURAN

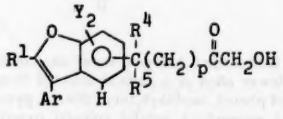
Francis J. Patracek, Bloomington, Minn., assignor to Riker Laboratories, Inc., Northridge, Calif.

Filed June 8, 1973, Ser. No. 368,174

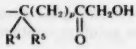
Int. Cl. C07d *5/40*

U.S. Cl. 260—346.2 R **9 Claims**

1. A compound of the formula



wherein R^1 is hydrogen, lower alkyl or halogen, provided that when R^1 is halogen, the group



is in the 6 or 7 position; R^4 is hydrogen or methyl; R^5 is hydrogen or when taken together with R^4 forms a methylene group (=CH_2); Ar is phenyl or substituted phenyl wherein the substituents are individually selected from lower alkyl, halogen, lower haloalkyl, lower alkoxy, lower haloalkoxy, lower dialkylamino, lower alkylthio, lower alkylsulfonyl, lower alkylsulfinyl and hydroxy; each Y is individually selected from hydrogen, lower alkyl, lower alkoxy, halogen, dialkylamino and hydroxy; and p is zero, one or two.

3,917,655

OXIDATION OF BENZENE TO MALEIC ANHYDRIDE USING A NEW CATALYST

Alessandro Di Cio, Bergamo, and Angelo Vitali, Scanzorosciate, both of Italy, assignors to Prolizenz AG, Chur, Switzerland

Continuation of Ser. No. 83,201, Oct. 22, 1970, abandoned. This application Nov. 30, 1972, Ser. No. 310,691

Claims priority, application Switzerland, Oct. 22, 1969, 15793/69

Int. Cl.[2] C07D *307/60*

U.S. Cl. 260—346.8 **9 Claims**

1. A process for the preparation of maleic anhydride comprising oxidizing benzene with an oxygen containing gas flow in the presence of a catalyst-complex expressed as a catalytic precursor consisting essentially of a mixture of the oxides and salts of molybdenum, vanadium, bismuth, phosphorous, sodium and silicon expressed as the oxides in the following amounts by weight: molybdenum as 1 part MoO_3, vanadium as 1.2 to 2.5 parts V_2O_5, bismuth as 0.2 to 1.1 parts Bi_2O_3, phosphorous as 0.02 to 0.05 parts P_2O_5, sodium as 0.03 to 0.06 parts Na_2O and silicon as 0.03 to 0.3 parts finely ground SiO_2, on a support.

3,917,656

CHEMICAL COMPOUNDS

John Buckley; Richard Budziarek; Andrew John Nicholas, and Edward Jervis Vickers, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

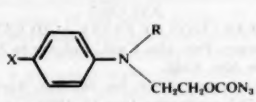
Filed Jan. 18, 1974, Ser. No. 434,640

Claims priority, application United Kingdom, Jan. 24, 1973, 3578/73

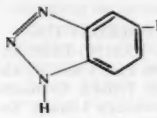
Int. Cl.[2] C07C *117/00*

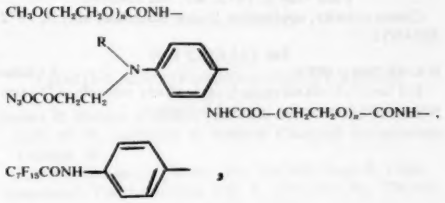
U.S. Cl. 260—349 **2 Claims**

1. Azidoformates of the formula

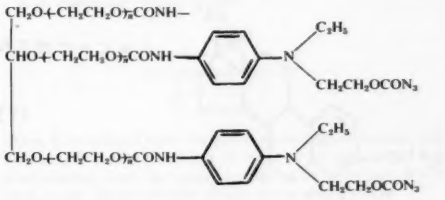


wherein R is an alkyl group of from 1 to 4 carbon atoms and X is selected from the group consisting of hydrogen, acrylamido, p-nitrophenylazo, p-chloro-phenylazo,





or



where *n* is greater than 6 and R is as defined.

3,917,657

16-METHYLENE-17-ACYLOXY-9β,10-α-PREGNA-4,6-DINENE-3,20 DIONES AND METHODS OF PRODUCING SAME

Harmen Van Kamp, and Anna Maria DeWachter, both of Weesp, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

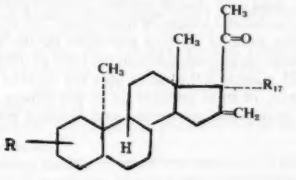
Continuation of Ser. No. 120,676, March 3, 1971, abandoned. This application Apr. 10, 1973, Ser. No. 349,806

Claims priority, application Netherlands, Mar. 4, 1970, 7003060

Int. Cl. 260 *239.5;* **C07c** *169/32*

U.S. Cl. 260—397.4 **13 Claims**

1. A compound of the formula:



wherein R is a
3-keto-4,6-bisdehydro,
3-keto-1,4,6-trisdehydro,
1,2-methylene-3-keto-4-dehydro,
1,2-methylene-3-keto-4,6-bisdehydro,
1,2-methylene-3-OR-3,5-bisdehydro,
1,2-methylene-3-OR-4,6-bisdehydro or a
3-OR-4,6-bisdehydro-group,
OR representing an esterified or an etherified hydroxy-group and R_{17} being an etherified hydroxy-group having 1 to 5 carbon atoms or an esterified hydroxy-group having 1 to 9 carbon atoms.

3,917,658
17α-(1,3'-ALKADIYNYL)-3-CYCLOALKOXY-17β-HYDROXY (OR ALKOXY) OESTRA-1,3,5(10)-TRIENES

Peter Feather, Guildford, England; Keith Emery Kendle, Aberdeen, Scotland, and John Michael Telford, Cranleith, England, assignors to BDH Pharmaceuticals Limited, England

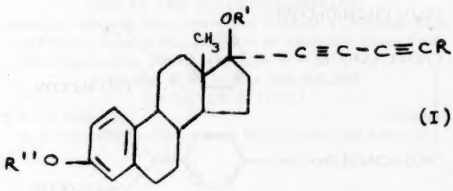
Filed May 3, 1973, Ser. No. 356,950

Claims priority, application United Kingdom, May 3, 1972, 20546/72

Int. Cl.[2] C07J *1/00*

U.S. Cl. 260—397.5 3 Claims

1. 17α-(1',3'-alkadiynyl)-3-cycloalkoxy steroids of the oestrane series having the general formula



(I)

where R is an alkyl group containing not more than 3 carbon atoms and R' is H, Me or Et and R'' is a cyclopentyl or cyclohexyl group.

3,917,659
SOLID GLYOXAL-UREA PRODUCTS

Charles William Glancy, and George Macon Bryant, both of Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed July 27, 1974, Ser. No. 446,414

Int. Cl.[2] C07C *126/08*

U.S. Cl. 260—555 R 2 Claims

1. A dry, solid urea-glyoxal reaction product mixture having an average molecular weight of from about 250 to about 325, said reaction product mixture produced by the reaction of urea and aqueous glyoxal, wherein the ratio of urea to glyoxal is from 0.25 mole to 0.9 mole of urea per mole of glyoxal, at a temperature of from ambient up to the boiling point, and thereafter drying and recovering said reaction product mixture.

3,917,660
PROCESS FOR PREPARING ω-NITROCARBOXYLATE

Hiroo Sasaki; Hisao Takemoto, and Kazuo Tago, all of Shin Nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Japan

Filed June 13, 1973, Ser. No. 369,598

Claims priority, application Japan, June 16, 1972, 47-60247

Int. Cl. C08h *17/36*

U.S. Cl. 260—404 8 Claims

1. In a process for preparing an ω-nitrocarboxylate salt by the nitrooxidation of a cycloalkene, cycloalkadiene or cycloalkatriene in a solution of an inert solvent with nitrogen dioxide and oxygen in the presence of a catalyst, the improvement which comprises: pretreating the nitrooxidation reaction product with an alkaline solution containing from 0.1 to 5 mole % alkali;

extracting the resulting α-nitrocycloalkanone, α-nitrocycloalkenone or α-nitrocycloalkadienone with an aqueous alkaline solution of an alkali selected from the group consisting of alkali metal hydroxides, alkali metal carbonates, and ammonia to obtain ω-nitrocarboxylate salt and a salt of said α-nitrocycloalkanone, said nitrocycloalkenone or said α-nitrocycloalkadienone and then cleaving the ring of said salt of said α-nitrocycloalkanone, said α-nitrocycloalkenone or said α-nitrocycloalkadienone to obtain the corresponding ω-nitrocarboxylate salt.

3,917,661
HYDROFORMYLATION OF UNSATURATED ORGANIC COMPOUNDS

Roy L. Pruett, Charleston, W. Va., and James A. Smith, Cleveland Heights, Ohio, assignors to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 1,278, Jan. 7, 1970, abandoned, which is a division of Ser. No. 658,055, Aug. 3, 1967, Pat. No. 3,527,809. This application Dec. 15, 1972, Ser. No. 315,648

Int. Cl.[2] C07C *67/30;* C11C *3/00*

U.S. Cl. 260—410.9 R 7 Claims

1. A process for the production of oxygenated products rich in normal aldehydes which comprises contacting (1) an alpha olefinic compound which is an alkyl alkenoate having up to 20 carbon atoms; (2) with carbon monoxide and hydrogen; (3) in the presence of a catalytic quantity of a complex catalyst consisting essentially of rhodium in complex combination with carbon monoxide and a triorgano phosphorus ligand of the group consisting of trialkylphosphites, tricycloalkylphosphites, triarylphosphites, and triarylphosphines wherein each organo moiety is a hydrocarbon and has up to 18 carbon atoms, said ligand having a Δ HNP value of at least about 425; and (4) at least 2 mols of free ligand as defined above per mol of rhodium; (5) at a temperature in the range of from about 50°C. to 145°C.; (6) at a total pressure of carbon monoxide and hydrogen of less than about 450 psia; and (7) a partial pressure attributable to carbon monoxide no greater than about 75 per cent of said total pressure; (8) thereby reacting said alpha olefinic compound with said carbon monoxide and hydrogen with the formation of oxygenated products rich in normal aldehydes which have one more carbon atom than said alpha olefinic compound.

3,917,662
PREPARATION OF FATTY ACID ESTERS

Robert L. Carney, Palo Alto, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 465,045, April 29, 1974, abandoned. This application June 17, 1974, Ser. No. 479,977

Int. Cl.[2] C11C *3/02*

U.S. Cl. 260—410.9 R 10 Claims

1. A process for the preparation of fatty acid esters of the formula

wherein R is an aliphatic hydrocarbon group having a carbon atom chainlength of at least 6 carbon atoms which is optionally substituted with one or more alkoxy groups and R′ is lower alkyl which comprises,

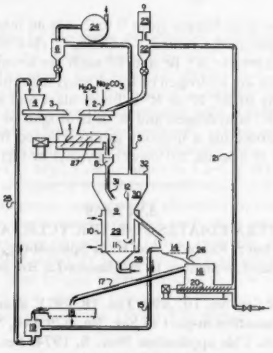
reacting a fatty acid of the formula

or an ammonium salt thereof with a titanate of the formula $(R'O)_4Ti$, the molar ratio of fatty acid to titanate being at least 1.0:0.9, at a temperature of 110° to 200°C.

3,917,663
METHOD OF MAKING ALKALI METAL PERCARBONATES

Willy Kegelart, Brussels, and Francis Nisol, Lillois-Witterzee, both of Belgium, assignors to Solvay & Cie, Brussels, Belgium

Filed Nov. 14, 1972, Ser. No. 306,219
Claims priority, application France, Nov. 15, 1971, 7140860
Int. Cl.² C01B *15/10*
U.S. Cl. 423—415 P **17 Claims**



1. A process for the manufacture of sodium percarbonate comprising the steps of:

introducing dry particles of sodium percarbonate into a mixer;

introducing at ambient temperature an aqueous hydrogen peroxide solution and an aqueous sodium carbonate solution thereby wetting the surface of said particles and forming additional sodium percarbonate, said hydrogen peroxide solution comprising from about 20 to about 70 percent by weight hydrogen peroxide and said sodium carbonate solution comprising from about 15 to about 34 percent by weight sodium carbonate;

thus producing a wet sodium percarbonate product having a water-content of less than 5 percent by weight;

drying the wet sodium percarbonate particles in a fluidized bed dryer, said sodium percarbonate particles being fluidized by a gas which leaves the fluidized bed having a relative humidity of not more than 80 percent, said fluidized bed being maintained at a temperature of from about 55°C to about 80°C;

dividing the dried sodium percarbonate particles into two portions;

recycling to the mixer one portion of the divided sodium percarbonate particles;

classifying the second portion of the divided sodium percarbonate particles to select a product having particles within a predetermined size range;

crushing the particles in said second portion which are larger than the predetermined size range; and

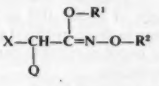
recycling to the mixer the crushed particles and the particles in said second portion which are smaller than the predetermined size range.

3,917,664
1-HALO-2-ALKOXYIMINO-2-ALKOXY ETHANE COMPOUNDS

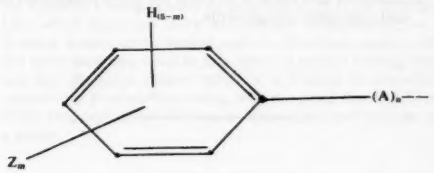
Sidney B. Richter, Chicago, and Ephraim H. Kaplan, Skokie, both of Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 758,569, Sept. 9, 1968, abandoned. This application Apr. 1, 1971, Ser. No. 130,435
Int. Cl.² C07C *119/18*
U.S. Cl. 260—453 R **6 Claims**

1. A compound of the formula



where X is selected from the group consisting of chlorine and bromine; R^1 and R^2 are alkyl of up to 10 carbon atoms; and Q is selected from the group consisting of hydrogen, lower alkyl, lower alkenyl, lower alkoxy, lower alkylthio and



wherein Z is selected from the group consisting of lower alkyl, lower alkoxy, chlorine, bromine and nitro; *m* is an integer from 0 to 3; A is methylene and *n* is an integer from 0 to 1.

3,917,665
PREPARATION OF PHENYLENE DIACETONITRILE

Constantine J. Bouboulis, Union, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

Continuation of Ser. No. 718,934, April 4, 1968, abandoned. This application Feb. 12, 1971, Ser. No. 115,140
Int. Cl. C07c *12/66*; C08g *20/20*
U.S. Cl. 260—465 H **2 Claims**

1. A process for preparing para-phenylene diacetonitrile which comprises:

a. dissolving sodium cyanide in a first solvent selected from the group consisting of water and a water-dimethylformamide mixture;

b. dissolving para-xylylene chloride in a second solvent consisting of dimethylformamide, the ratio of second solvent to first solvent being about 2 to 1 to about 1 to 1.5;

c. adding the para-xylylene chloride solution to the sodium cyanide solution;

d. precipitating the para-phenylene diacetonitrile so formed by adding to the reactant mixture copious amounts of water; and

e. separating the para-phenylene diacetonitrile from the water-dimethylformamide mixture.

3,917,666

LIQUID COPOLYMERS OF VINYL MONOMERS AND UNSATURATED DIESTERS

Hubert J. Fabris; Robert J. Herold, both of Akron, and Edwin M. Maxey, Kent, all of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 309,234, Nov. 24, 1972, Pat. No. 3,850,861. This application Apr. 5, 1974, Ser. No. 458,301

Int. Cl.[2] C07C *69/34, 69/76, 121/28*

U.S. Cl. 260—465.4 8 Claims

1. A method for the preparation of a liquid copolymer having an average functionality of 2 to 6 and selected from the class consisting of

a copolymer of a vinyl monomer selected from styrene, methacrylonitrile, acrylonitrile and a lower alkyl acrylate or methacrylate with a polyalkylene ether itaconate macromonomer having an equivalent weight of about 100 to 3,000 per hydroxyl group, having one to three hydroxyl groups per molecule, and having one copolymerizable carbon-to-carbon double bond per molecule; and a copolymer of a vinyl monomer selected from vinyl chloride, vinylidene chloride and vinyl acetate with a polyalkylene ether maleate or fumarate macromonomer having an equivalent weight of about 100 to 3,000 per hydroxyl group, having one to three hydroxyl groups per molecule, and having one copolymerizable carbon-to-carbon double bond per molecule,

said method consisting essentially of

1. mixing the macromonomer and the vinyl monomer in a mole ratio of 1:5 to 1:50 simultaneously with a chain transfer agent and an initiator for radical polymerization, said initiator being selected from peroxides and aliphatic diazo compounds; and
2. activating said initiator to cause the copolymerization of said copoylmer components.

3,917,667

PROCESS FOR PREPARING GEM-DIHALOCYCLOPROPANECARBOXYLIC ACID DERIVATIVES

Pieter A. Verbrugge, and Elisabeth W. Uurbanus, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

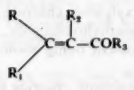
Filed May 14, 1973, Ser. No. 359,931

Claims priority, application United Kingdom, May 16, 1972, 22911/72

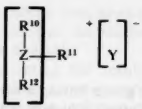
Int. Cl.[2] C07C *69/74, 103/19*

U.S. Cl. 260—468 H 10 Claims

1. A process for preparing esters and amides of gem-dihalocyclopropanecarboxylic acids which comprises contacting an aqueous phase containing an alkali metal hydroxide and an organic phase containing both a haloform and an acid derivative of the formula



where R is hydrogen, alkyl or phenyl and R_1 and R_2 each independently is hydrogen or alkyl, R_3 is alkyloxy or substituted amino with the proviso that when R_2 is hydrogen, R_3 is only tert-alkyloxy or mono- or disubstituted amino, in the presence of a catalyst consisting essentially of a tertiary onium compound of the formula



in which Z is sulfur, selenium or tellurium with the proviso that when Z is sulfur then R^{10}, R^{11} and R^{12} each is alkyl or cycloalkyl and when Z is selenium or tellurium then R^{10}, R^{11} and R^{12} each is alkyl; and Y is hydroxide, iodide, bromide, chloride, fluoride, alkyl sulfate, tetrafluoroborate or tosylate.

3,917,668

PROSTANOIC ACID INTERMEDIATES

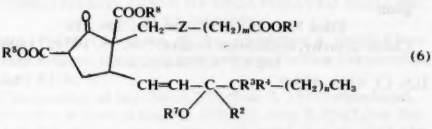
Nedumparambil A. Abraham, Dollard des Ormeaux; Jehan F. Bagli, Kirkland, and Tibor Bogri, Montreal, all of Canada, assignors to American Home Products Corporation, New York, N.Y.

Filed Apr. 16, 1973, Ser. No. 351,381

Int. Cl.[2] C07C *61/38, 69/74*

U.S. Cl. 260—468 D 9 Claims

1. A compound of the formula 6



(6)

in which *m* is an integer from 0 to 2, *n* is an integer from 2 to 5, Z represents the radical $-(CH_2)_3-$, cis-CH=CH-CH_2- or cis-CH_2-CH=CH-, R^1, R^5 and R^8 each are lower alkyl, R^2, R^3 and R^4 each are hydrogen or lower alkyl with the provisos that at least one of R^2, R^3 or R^4 is lower alkyl and at least one of R^2, R^3 or R^4 is hydrogen and R^7 is hydrogen or a radical suitable for protecting a hydroxy group selected from the group consisting of acetals, tri(lower)alkylsilyl or tert-butoxy.

3,917,669

INTERMEDIATES FOR TRICYCLIC AMINES

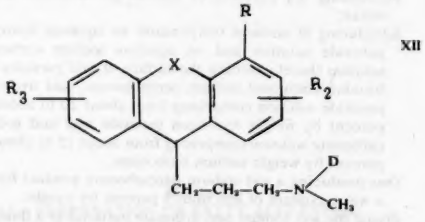
Emilio Kyburz, Reinach, and Hans Spiegelberg, Basel, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 107,499, Jan. 18, 1971, abandoned, which is a continuation-in-part of Ser. No. 679,644, Nov. 1, 1967, abandoned. This application Mar. 8, 1974, Ser. No. 449,319

Int. Cl.[2] C07C *125/06*

U.S. Cl. 260—471 C 1 Claim

1. A compound of the formula



XII

wherein R is chlorine or fluorine, R_2 and R_3 are hydrogen, chlorine or fluorine, X is ethylene or vinylene and D is lower alkanoyl, phenyl-(lower alkanoyl), lower alkylsulfonyl, phenylsulfonyl, lower alkylphenylsulfonyl, phenyl-(lower alkyl)-sulfonyl, lower carbalkoxy, carbophenoxy or lower carbophenylalkoxy.

3,917,670
CARBONYLATION OF ORGANOMERCURIALS

William C. Baird, Jr., Westfield; Ronald L. Hartgerink, Edison, and John H. Surridge, Scotch Plains, all of N.J., assignors to Exxon Research & Engineering Company, Linden, N.J.

Filed Mar. 9, 1972, Ser. No. 233,338
Int. Cl.[2] C07C *101/54*
U.S. Cl. 260—471 R 13 Claims

1. A method for preparing nonheterocyclic carboxylic acid esters, said method comprising the steps of reacting an organo mercury compound of the formula R—HgQ wherein R is one selected from the group consisting of C_1–C_{30} linear, branched and cyclic alkyls, alkenyls, and alkynyls; and C_6–C_{18} aryls and bears one or more substituents located at any position on the carbon skeleton, which substituents are selected from the group consisting of halide, hydroxide, carboxylate, carboxyl, carboalkoxyl, cyano, amino, acylamino, alkylamino, arylamino, nitro, sulfonate, carbonyl aryl, alkoxyl, aryloxyl, acyl, aroyl, nitrate, hydrosulfide, alkylsulfide, arylsulfide, and azide, and Q is an anion selected from the group consisting of chloride, bromide, iodide, perchlorate, nitrate, sulfate, bisulfate, hydroxide, alkoxide, aryloxide, acetate, propionate, butyrate, pivalate, neohexanoate, benzoate, chloroacetate, trichloroacetate, trifluoroacetate, methyl sulfonate, phenyl sulfonate, trifluoromethyl sulfonate with carbon monoxide and an alcohol in the presence of a catalyst, said catalyst being characterized by one of the following formulae:

$$[(R_3''Z)_{m-x}(A)_x]\,MQ_n' \qquad [(R_2''Z\text{-}R''\text{-}ZR_2'')_x(A)_x]\,MQ_n'$$

I II

wherein R'' can be the same or different and each are ones selected from the group consisting of C_1–C_{12} linear and branched hydrocarbyl; C_3–C_{12} cyclic alkyls, C_2–C_{12} alkenyls; C_2–C_{12} alkynyls; C_1–C_{12} alkoxy; C_6–C_{18} aryloxy and C_6–C_{18} aryl; said R'' groups can be substituted with halides, hydroxides, carboxylate, carboxyl, carboalkoxyl, cyano, amino, acylamino, C_1–C_6 alkylamino, nitro, sulfonate, C_6–C_{10} arylamino, carbonyl, C_6–C_{10} aryl, C_1–C_{12} alkoxyl, C_6–C_{10} aryloxyl, acyl and aroyl; Z is either a metal or metal oxide and is one selected from the group consisting of phosphorus, arsenic, antimony and the pentavalent oxide of each; A is selected from the group consisting of carbonyl, nitrile, isonitrile, and amine; M is a Group VIII metal; Q' is an anion; *m* is an integer ranging from 0 to 4; *x* is an integer ranging from 0 to 3; *n* is an integer ranging from 0 to 4; and the values of *m* and *n* are determined by the oxidation state of the Group VIII metal.

3,917,671
LIGHT STABLE BISMUTH OXYCHLORIDE AND PROCESS FOR PREPARING SAME

Roger D. Piper, Des Peres, Mo., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Filed Feb. 6, 1974, Ser. No. 440,234
Int. Cl.[2] C01G *29/00*; C01B *11/00*
U.S. Cl. 423—472 7 Claims

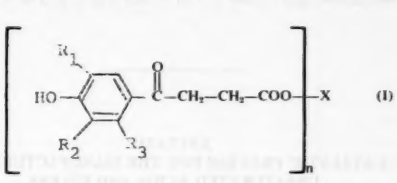
1. A process for the preparation of ultra violet light stable bismuth oxychloride which comprises heating bismuth oxychloride at a temperature in the range of from about 300° C. to about 700° C. for a period of time sufficient to stabilize the bismuth oxychloride against ultra violet light but insufficient to cause substantial sintering of the bismuth oxychloride, said period of time being in the range of from about 1 to about 24 hours.

3,917,672
HYDROXYBENZOYLALKANOIC ACID ESTERS

Andreas Schmidt, Reinach, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

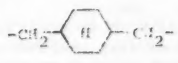
Filed Aug. 6, 1973, Ser. No. 385,939
Claims priority, application Switzerland, Aug. 17, 1972, 12196/72
Int. Cl.[2] C07C *69/76*
U.S. Cl. 260—473 S 6 Claims

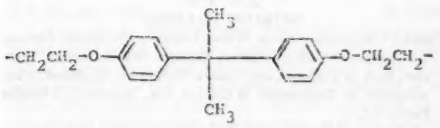
1. A compound of the formula

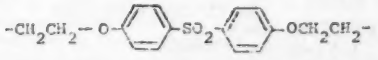


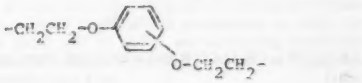
(I)

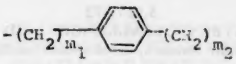
in which R_1 and R_2 independently of one another are a primary or secondary alkyl group with 1–5 carbon atoms or a cycloalkyl group with 6–8 carbon atoms, R_3 is hydrogen or methyl, and X is a straight chain, branched or cyclic alkyl group with 1–18 carbon atoms, aralkyl with 7–9 carbon atoms, thiaalkyl with 3–20 carbon atoms, the oxygen of the carboxyl group in the Formula I being bonded to a carbon atom in the thiaalkyl radical which carries no further hetero-atoms, alkylene with 2–18 carbon atoms, oxaalkylene with 4–18 carbon atoms with the oxygen of the carboxyl group in the Formula I being bonded to a carbon atom in the oxaalkylene which does not carry any further hetero-atoms, thiaalkylene with 4–18 carbon atoms, with the oxygen of the carboxyl group in the Formula I being bonded to a carbon atom in the thiaalkylene which does not carry any further hetero-atoms, or a 3-valent hydrocarbon radical with 3–10 carbon atoms, with not more than one bond to the carboxyl groups leading from one and the same carbon atom, or a 4-valent hydrocarbon radical with 4–10 carbon atoms, with not more than one bond to the carboxyl groups leading from the same carbon atom, or a group











wherein m_1 and m_2 are 1, 2 or 3, and n is 1, 2, 3 or 4.

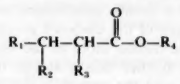
3,917,673

CATALYTIC PROCESS FOR THE MANUFACTURE OF UNSATURATED ACIDS AND ESTERS

Windell C. Watkins, Longview, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 26, 1973, Ser. No. 409,822
Int. Cl.² C07C 51/00, 67/30
U.S. Cl. 260—486 D 8 Claims

1. A process for making unsaturated acids and esters by dehydrogenation of a compound defined by the formula



wherein each of R_1, R_2, R_3 and R_4 is selected from hydrogen and lower alkyl groups containing 1–4 carbon atoms, which process comprises contacting a feed gas mixture comprising said compound, oxygen and water at a temperature in the range of from about 250° to about 600°C. with a solid catalyst consisting of the calcined residue of a mixture of bismuth oxynitrate, iron phosphate and lead phosphate wherein the atomic ratio of bismuth to iron is from about 0.1:1 to about 12:1, and the atomic ratio of lead to iron is from about 0.1:1 to about 10:1, which calcining is conducted at a temperature above about 500°C.

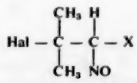
3,917,674

NITROSO HALIDES

Hamish Christopher Swan Wood, Glasgow, Scotland; Alexander Stuart, Bromley; Adrian Charles Ward Curran, Harrow, both of England, and Saieba Al-Hassan, Baghdad, Iraq, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 162,297, July 13, 1971, Pat. No. 3,810,893. This application Feb. 19, 1974, Ser. No. 443,504
Claims priority, application United Kingdom, July 27, 1970, 36289/70
Int. Cl.² C07C 81/04, 81/08
U.S. Cl. 260—488 F 6 Claims

1. A compound of formula



wherein X is $CH_2O.CO.R$ Hal is a halogen atom and R is lower alkyl.

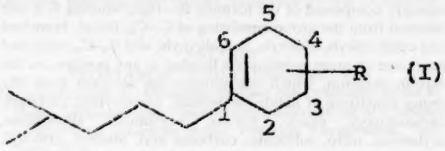
3,917,675

NOVEL ODORANTS

Paul Albert Ochsner, Geneva, Switzerland, assignor to Givaudan Corporation, Clifton, N.J.

Filed Mar. 6, 1974, Ser. No. 448,607
Claims priority, application Switzerland, Mar. 15, 1973, 3759/73; Jan. 17, 1974, 616/74
Int. Cl.² C07C 69/07, 69/145, 69/24
U.S. Cl. 260—488 R 4 Claims

1. A compound having the formula



wherein R represents an alkanoyl-oxymethyl group in the 3 - or 4-position, said alkanoyl having 1–3 carbon atoms and the broken line denotes an optional carbon-carbon bond, and mixtures thereof.

3,917,676

PROCESS FOR PRODUCING ALLYLACETATE

Hisashi Kisaki; Yukihiro Tsutsumi, and Koshuke Takeshige, all of Shin Nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

Continuation-in-part of Ser. No. 214,410, Dec. 30, 1971, abandoned. This application Nov. 6, 1973, Ser. No. 413,198
Claims priority, application Japan, Dec. 30, 1970, 45-126775
Int. Cl.² C07C 67/05, 69/155
U.S. Cl. 260—497 A 9 Claims

1. A process for producing allylacetate which comprises reacting propylene with acetic acid and oxygen in the vapor phase in the presence of a ternary catalyst system consisting essentially of

a. 0.01 to 10.0 weight percent based on the weight of the carrier, of palladium metal
b. 0.01 to 20.0 weight percent based on the weight of the carrier, of lead metal
c. 0.01 to 30.0 weight percent based on the carrier of alkali or alkaline earth metal salts selected from the group consisting of carboxylate having 1 – 4 carbon atoms, carbonate and borate, wherein the reaction temperature is from 100° to 300°C and the reaction pressure is sufficient to maintain the reactants and products in the gaseous phase.

3,917,677

PRODUCTION OF CARBOXYLIC ACID ESTERS BY HYDROESTERIFICATION

Donald E. Morris, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed May 17, 1972, Ser. No. 254,211
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² C07C 67/38
U.S. Cl. 260—497 A 6 Claims

1. In a process for the production of carboxylic acid esters, wherein an ethylenically unsaturated hydrocarbon having from 2 to 30 carbon atoms is reacted with carbon monoxide and a primary or secondary alcohol at a temperature of 50°C to 300°C and at partial pressures of carbon monoxide from 100 psia to 1,500 psia, the improvement which comprises contacting the said reactants in the presence of a solution, essentially comprising (1) a member of the class consisting of acetylacetonatodicarbonylrhodium(I), μ,μ,-diacetatotetracarbonyldirhodium(I), propionatocarbonylbis(tripropylphosphine)rhodium(I), acetatocarbonylbistriphenylphos-

phinerhodium(I), tetraacetatodirhodium(II), or N,N-dimethyldithiocarbamatodicarbonylrhodium(I) and (2) a tertiary organophosphorus component having from 3 to 90 carbon atoms, the said solution being substantially free of halogen.

3,917,678
ORGANIC ACID SALTS OF 1-[o-[(3-DIMETHYLAMINOPROPYL)THIO]PHENYL]-3-ETHYLUREA

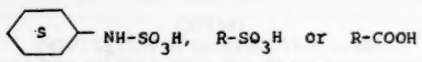
John Krapcho, Somerset, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 220,700, Jan. 25, 1972, Pat. No. 3,862,328, which is a continuation-in-part of Ser. No. 46,520, June 15, 1970, abandoned, which is a continuation-in-part of Ser. No. 760,072, Sept. 16, 1968, abandoned. This application Feb. 26, 1973, Ser. No. 335,621

Int. Cl.[2] C07C *143/00, 149/30*

U.S. Cl. 260—501.12 **6 Claims**

1. Pharmaceutically acceptable organic acid salt of 1-[o-[(3-dimethylaminopropyl)thio]phenyl]-3-methylurea, wherein the organic acid salt moiety is



and R is a member of the group consisting of phenyl, naphthyl, lower alkyl phenyl, aminophenyl, lower alkanoylamidophenyl, lower alkylnaphthyl, aminonaphthyl and lower alkanoylamidonaphthyl.

3,917,679
QUATERNARY AMMONIUM SALTS OF N-DIALKYLAMINOALKYL-N-(2-INDANYL)ANILINES

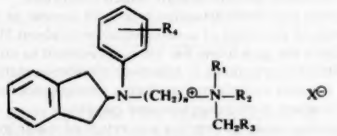
Bryan B. Molloy, and Ronald R. Tuttle, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 12, 1974, Ser. No. 460,643

Int. Cl.[2] C07C *87/46*

U.S. Cl. 260—501.15 **8 Claims**

1. The compound of the formula



wherein:

n is 2 or 3;

R_1 and R_2 independently are C_1–C_4 alkyl, or R_1 and R_2 together with the adjacent nitrogen atom form a heterocyclic ring system selected from among pyrrolidino, piperidino, or morpholino;

R_3 is hydrogen, C_1–C_3 alkyl, or C_2–C_3 alkenyl;

R_4 is hydrogen, methyl, methoxy, trifluoromethyl, or chloro; and

X is a pharmaceutically acceptable anion.

3,917,680
5,6,7,8,9,10-HEXAHYDRO-5-PHENYL-5,9-METHANOBENZOCYCLOOCTEN-11-AMINES AND RELATED COMPOUNDS

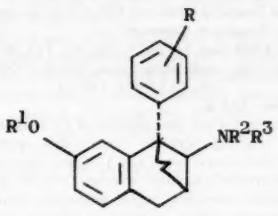
John R. Potoski, Spring City, and Meier E. Freed, Paoli, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Dec. 28, 1973, Ser. No. 429,316

Int. Cl.[2] C07C *91/02*

U.S. Cl. 260—571 **9 Claims**

1. A compound of the formula:



wherein R is hydrogen, lower alkyl, lower alkoxy, fluoro, or chloro; R^1 is hydrogen, or lower alkyl, R^2, and R^3 are independently selected from the group consisting of hydrogen and lower alkyl; and the pharmaceutically acceptable acid addition salts thereof.

3,917,681
PURIFICATION OF ISOPHTHALIC ACID

Robert D. Shinn, Midlothian, and Willis C. Keith, Tinley Park, both of Ill., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 827,214, May 23, 1969, abandoned. This application Mar. 29, 1972, Ser. No. 239,304

Int. Cl. C07c *51/42*

U.S. Cl. 260—525 **18 Claims**

1. A process for the purification of isphthalic acid produced by the liquid phase, oxygen-containing gas oxidation of metaxylene containing a small amount of paraxylene which comprises passing to a first crystallization zone, a solution of the crude, solid oxidation product in a medium containing water and about 75 to 99 weight percent acetic acid at a temperature sufficient to effect dissolution of essentially all of the isophthalic acid in the medium, withdrawing vaporized acetic acid from said first crystallization zone at a temperature of about 180° to 375°F. and pressure sufficient to maintain a liquid phase to crystallize isophthalic acid from said solution, passing the resulting slurry of isophthalic crystals from said first crystallization zone to a second crystallization zone, withdrawing vaporized acetic acid from said second crystallization zone to maintain a temperature which is significantly lower than the first crystallization zone but sufficient to maintain essentially all impurities in solution and at a pressure sufficient to maintain a liquid phase, which temperature is within the range from about 105° to 265°F. and recovering isophthalic acid of increased purity from slurry withdrawn from said second crystallization zone.

3,917,682
PRODUCTION OF ACETIC ACID BY OXIDATION OF BUTENES

Tetsuo Mizukami; Takeshi Akahane, and Yoshio Fuchigami, all of Kurashiki, Japan, assignors to Kuraray Co., Ltd., Tokyo, Japan

Filed May 21, 1970, Ser. No. 39,507
Claims priority, application Japan, June 2, 1969, 44-43158
Int. Cl.[2] C07C *53/08*, *51/32*
U.S. Cl. 260—533 R 11 Claims

1. In the process for the production of acetic acid by gas phase oxidation of butenes with molecular oxygen at elevated temperatures characterized by passing the butene and molecular oxygen at elevated temperatures over an effective amount of a catalyst comprising vanadium oxide and titanium oxide, the improvement which comprises employing a catalyst wherein the atomic ratio of vanadium to titanium is 10:1 to 1:10 and more than 50% of the titanium oxide is in the rutile crystalline form.

3,917,683
PROCESS FOR THE PREPARATION OF DL-METHIONINE

Shunji Ouchi, and Chisei Shibuya, both of Tokyo, Japan, assignors to Deutsche Gold-und Silber-Scheideanstalt Vormals Roessler, Frankfurt, Germany

Filed May 10, 1971, Ser. No. 141,567
Claims priority, application Japan, May 8, 1970, 45-38629
Int. Cl.[2] C07C *149/247*
U.S. Cl. 260—534 S 4 Claims

1. A process for the preparation of DL-methionine which comprises reacting acrolein cyanohydrin with an excess amount of methylmercaptan and 1–4 moles per mole of acrolein cyanohydrin of a member selected from the group consisting of, gaseous ammonia, liquid ammonia, ammonium bromide, ammonium sulfate, ammonium acetate and ammonium cyanide together with 1–4 moles per mole of acrolein cyanohydrin of a member selected from the group consisting of carbon dioxide gas, solid carbon dioxide and sodium carbonate in the presence of an organic solvent or an aqueous organic solvent of which the water content is not greater than 50% by weight at a temperature of 30° to 200°C to accomplish in addition reaction of the methyl mercaptan to the double bond of the acrolein cyanohydrin simultaneously with a hydantoin ring forming reaction followed by hydrolysis of the resultant product.

4. A process for the preparation of DL-methionine which comprises reacting acrolein cyanohydrin with an excess amount of methylmercaptan and 1–4 moles per mole of acrolein cyanohydrin of a member selected from the group consisting of ammonium carbonate, ammonium hydrogen carbonate and ammonium carbamate in the presence of an organic solvent or an aqueous organic solvent of which the water content is not greater than 50% by weight at a temperature of 30 to 200 °C to accomplish an addition reaction of the methylmercaptan to the double bond of the acrolein cyanohydrin simultaneously with a hydantoin ring-forming reaction followed by hydrolysis of the resultant product.

3,917,684
RECOVERY OF LYSINE VALUES BY REMOVAL OF AMMONIUM CHLORIDE FROM LYSINE CONTAINING LIQUORS

Stylianos Sifniades, Madison, and Allen Abraham Tunick, Boonton, both of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed July 30, 1973, Ser. No. 383,738
Int. Cl.[2] C07C *99/08*, *101/24*
U.S. Cl. 260—534 L 4 Claims

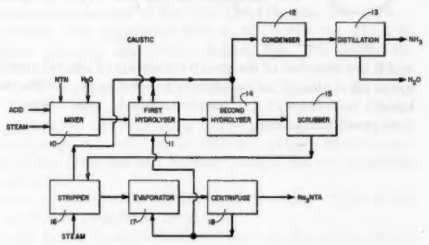
1. In a method of converting lysine dihydrochloride in aqueous solution to crystalline lysine monohydrochloride wherein lysine monohydrochloride is crystallized from the aqueous solution by adding ammonia and water miscible volatile organic solvent, the improvement comprising:

a. fractionating the resulting aqueous medium after separation of the crystalline lysine monohydrochloride to separate therefrom the organic solvent and substantially all the ammonia;
b. acidifying the aqueous medium remaining after step (a) with hydrochloric acid to precipitate NH_4Cl;
c. removing the precipitated NH_4Cl; and
d. combining the solution remaining after step (c), and consisting essentially of hydrochloric acid, with a lysine precursor which yields lysine after acidic hydrolysis and with sufficient HCl to provide at least 2 moles HCl per mole of said precursor, thereby producing lysine dihydrochloride.

3,917,685
PROCESS FOR PREPARING TRISODIUM NITRILOTRIACETATE

Charles R. Bergeron, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Mar. 22, 1971, Ser. No. 126,534
Int. Cl.[2] C07C *99/10*
U.S. Cl. 260—534 E 11 Claims



1. A process for converting nitrilotriacetonitrile into particulate trisodium nitrilotriacetate which comprises,

reacting said nitrilotriacetonitrile with caustic in the presence of an excess of caustic alkali up to about 50 percent above the stoichiometric amount required to convert the nitrilotriacetonitrile to trisodium nitrilotriacetate forming a solution containing less than a precipitation amount of trisodium nitrilotriacetate and caustic,

subjecting said solution to evaporation of water to produce crystallization of a part of the trisodium nitrilotriacetate contained therein producing a mixture containing particulate trisodium nitrilotriacetate and an aqueous mother liquor which contains trisodium nitrilotriacetate and caustic as solute,

subjecting said mixture to separation to recover the particulate trisodium nitrilotriacetate from the mother liquor, and

feeding a first part of the mother liquor to the evaporation step and a second part to the reacting step, the ratio of said first part to said second part ranging from about 1:2 to about 20:1.

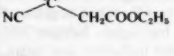
3,917,686
METHOD FOR PRODUCING CITRIC ACID AND CITRATES

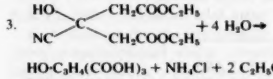
Herman Alexander Bruson, Woodbridge, Conn., assignor to Bjorksten Research Laboratories, Inc., Madison, Wis.

Filed Oct. 7, 1974, Ser. No. 512,247
Int. Cl.[2] C07C *59/16*
U.S. Cl. 260—535 P **3 Claims**

1. In the process for making citric acid in accordance with the equations

1. $COCl_2 + 2\ CO{=}CH + 2\ C_2H_5OH \rightarrow CO(CH_2COOC_2H_5)_2$

2. $CO(CH_2COOC_2H_5)_2 + HCN \rightarrow$ 

3. 

$HO\text{-}C_3H_4(COOH)_3 + NH_4Cl + 2\ C_2H_5OH$

the improvement which consists of reacting phosgene and ketene to form the intermediate acetonedicarboxylic acid, in a solvent selected from the class consisting of di-n-butyl - ortho-phthalate and tricresyl phosphates.

3,917,687
PREPARATION OF DICARBOXYLIC ACIDS

Lucien Billet, and Guy Lartigau, both of Lyon, France, assignors to Rhone-Poulenc S.A., Paris, France

Filed Sept. 17, 1973, Ser. No. 397,977
Claims priority, application France, Sept. 18, 1972, 72.32963
Int. Cl.[2] C07C *51/00*
U.S. Cl. 260—537 P **17 Claims**

1. In a process for the preparation of an alkane-dicarboxylic acid containing at least 8 carbon atoms in the linear divalent chain separating the hydroxycarbonyl groups, which comprises deperoxidising a peroxide obtainable by reacting hydrogen peroxide with a cyclo-alkanone of the general formula:

(I)

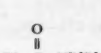
in which R represents a linear or branched divalent saturated hydrocarbon radical containing 4 to 7 carbon atoms in the linear part of R in the presence of an iron salt and a solvent, the improvement wherein the deperoxidization is carried out with a ferrous carboxylate in the presence of a first alkane-carboxylic acid containing at least 2 carbon atoms, as solvent.

3,917,688
PROCESS FOR THE PREPARATION OF N-MONOFLUORO-ACID AMIDES, N-MONOFLUORO AND N,N-DIFLUORO-TERTIARY AMINES

Derek Harold Richard Barton, London, England, and Robert Henry Hesse, Cambridge, Mass., assignors to Research Institute for Medicine And Chemistry Inc., Cambridge, Mass.

Filed June 26, 1973, Ser. No. 373,805
Int. Cl.[2] C07C *125/00*
U.S. Cl. 260—543 F **14 Claims**

1. A process for the preparation of a compound selected from the group consisting of N - monofluoro-acid amides, N - monofluoro - and N, N-difluoro - tertiary amines which comprises reacting in polar organic solvent an acid amide of the formula



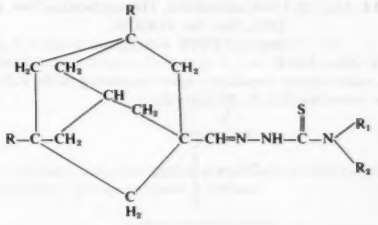
wherein R^1 represents a $C_{1\text{-}30}$ alkyl group, a $C_{3\text{-}30}$ cycloaliphatic group, an aralkyl group containing 1 – 10 carbon atoms in the alkyl chain or an aryl group or any of these groups substituted by at least one of oxo, nitro, cyano, halo, hydroxy, esterified hydroxy, sulphonyl, lower alkoxy, aralkoxy, or aryloxy; R^2 and R^3 are the same as R^1 or hydrogen or are taken together to form a divalent organic radical, with a hypofluorite having the formula ROF, where R represents a lower fluoroalkyl group containing at least two fluorine atoms per carbon atom or a fluorinated covalent inorganic group.

3,917,689
ADAMANTYL THIADIAZOLE INTERMEDIATES

Venkatachala L. Narayanan, North Brunswick, and Jack Bernstein, New Brunswick, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 842,376, July 16, 1969, abandoned, which is a division of Ser. No. 670,756, Sept. 26, 1967, Pat. No. 3,483,204, which is a continuation-in-part of Ser. No. 523,249, Jan. 27, 1966, abandoned. This application Aug. 3, 1972, Ser. No. 277,699
Int. Cl.[2] C07C *157/05*
U.S. Cl. 260—552 SC **10 Claims**

1. A compound of the formula



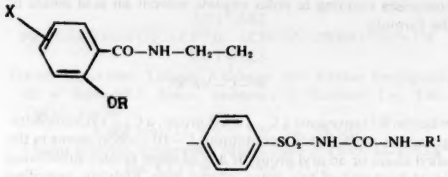
wherein each R is a member of the group consisting of hydrogen, halogen, lower alkyl and lower alkanoylamino, R_1 is hydrogen and R_2 is a member of the group consisting of 1-adamantyl, hydroxy-lower alkyl and phenyl-lower alkyl.

3,917,690
BENZENESULFONYL UREAS AND PROCESS FOR THEIR MANUFACTURE

Helmut Weber, Frankfurt am Main; Walter Aumüller, Kelkheim; Rudi Weyer, Frankfurt am Main; Karl Muth, Kelkheim and Felix Helmut Schmidt, Mannheim-Neuostheim, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

This application Feb. 2, 1971, Ser. No. 112,063
The portion of the term of this patent subsequent to July 8, 1986, has been disclaimed.
Int. Cl.[2] C07C *127/16*
U.S. Cl. 260—553 DA **11 Claims**

1. A benzenesulfonyl-urea corresponding to the formula



in which

R represents lower alkyl or lower alkenyl,

X represents chlorine, lower alkyl, or lower alkoxy, in 4- or 5-position to the carbonamide group,

R^1 represents endomethylene-cyclohexenyl, endomethylene-cyclohexyl, endoethylene-cyclohexyl, endoethylene-cyclohexenyl, and its salts of a pharmaceutically acceptable base.

3,917,691

PERFLUORO ALKYL SULFONAMIDES USEFUL AS WATER AND OIL REPELLENCY AGENTS

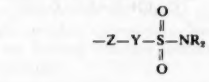
Dilip K. Ray-Chaudhuri, Somerville, and Carmine P. Iovine, Somerset, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Division of Ser. No. 278,957, Aug. 9, 1972, Pat. No. 3,810,939, which is a continuation-in-part of Ser. No. 18,720, March 11, 1970, abandoned, which is a continuation-in-part of Ser. No. 755,814, Aug. 28, 1968, abandoned. This application Nov. 12, 1973, Ser. No. 414,870

Int. Cl.² C07C *143/72*

U.S. Cl. 260—556 F **6 Claims**

1. A water and oil repellency agent consisting of the sulfonamides corresponding to the formula



wherein

R is selected from the group consisting of hydrogen atoms and alkyl radicals and

wherein

Z is a radical containing from 3 to 20 carbon atoms inclusive and is selected from the group consisting of straight and branched chain perfluoro alkyl radicals; and

Y is a radical containing from 2 to 11 carbon atoms selected from the group consisting of alkylene and alkenylene radicals.

3,917,692

ARYLSULFONYLCARBAMOYL-1,3-DICARBONYLALICYCLIC

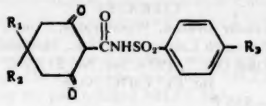
Frederick A. Grunwald, Evansville, Ind., assignor to Mead Johnson & Company, Evansville, Ind.

Filed June 12, 1974, Ser. No. 478,497

Int. Cl.² C07C *143/78;* **A61K** *31/18*

U.S. Cl. 260—556 AR **12 Claims**

1. A compound having the formula



wherein

R_1 is lower alkyl from 1 to 5 carbon atoms inclusive or phenyl;

R_2 is hydrogen or alkyl from 1 to 3 carbon atoms inclusive; R_1 and R_2 taken together form $-(CH_2)_5-$;

R_3 is hydrogen, halogen or lower alkyl of 1 to 4 carbon atoms inclusive; and basic salts thereof.

3,917,693

METHOD FOR CONCENTRATING AN ACRYLAMIDE AQUEOUS SOLUTION

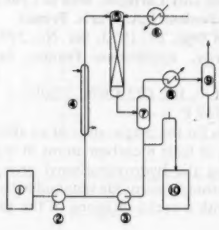
Shiro Asano, Yokohama; Kiyotaka Yoshimura, Mobara; Ryoji Tsuchiya, Kamakura, and Tadatoshi Honda, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals Inc., Tokyo, Japan

Filed Dec. 4, 1972, Ser. No. 311,830

Claims priority, application Japan, Dec. 6, 1971, 46-97895

Int. Cl.² C07C *103/08*

U.S. Cl. 260—561 N **9 Claims**



1. Method for concentrating acrylamide aqueous solutions comprising concentrating the acrylamide aqueous solution by evaporating the water content thereof while maintaining the said solution in contact with from 0.1 to 30 moles of air per mole of water being evaporated at a temperature of between 60°C and 100°C and a pressure of between 3,678 and 200 mm. Hg.

3,917,694

CHLORINATION OF 3-OXOALKANAMIDES

Arend Reinink, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 12, 1974, Ser. No. 460,312

Int. Cl.² C07C *103/34*

U.S. Cl. 260—561 K **8 Claims**

1. In a process for selectively chlorinating an N-alkyl- or N,N-dialkyl-3-oxoalkanamide to the corresponding 2-monochloro-3-oxoalkanamide by treating a mixture of the N-alkyl- or N,N-dialkyl-3 -oxoalkanamide, and a lower alkanol with chlorine, at a temperature of from about −35° C to about 15° C, the improvement which comprises initially limiting the rate at which the chlorine is charged to the reaction zone and thereafter progressively increasing the rate as the reaction proceeds, the initial rate at which the chlorine is charged to the reaction zone being at least about 0.04 mole per hour per mole of oxoalkanamide charged, and the ratio between the rates at which the chlorine is introduced into the reaction zone

at the end and at the beginning of the chlorination being greater than 2.0.

3,917,695

PREPARATION OF N-ACETYL-P-AMINOPHENOL

Hyman L. Schulman, Fort Lee; Frank A. Baron, Short Hills, and Alan E. Weinberg, Verona, all of N.J., assignors to Mallinckrodt, Inc., St. Louis, Mo.

Continuation of Ser. No. 333,509, Feb. 20, 1973, abandoned, which is a continuation of Ser. No. 33,080, April 29, 1970, abandoned. This application June 26, 1974, Ser. No. 483,364

Int. Cl.² C07C *103/10*

U.S. Cl. 260—562 A **6 Claims**

1. A method for the preparation of substantially pure N-acetyl-p-aminophenol which comprises catalytically hydrogenating nitrobenzene is aqueous sulfuric acid in the presence of platinum, palladium or a mixture thereof as catalyst, separating the catalyst from the reaction mixture, adding aniline to the reaction mixture, neutralizing the reaction mixture, separating p-aminophenol from the neutralized mixture, then dissolving the p-aminophenol in aqueous acetic acid to form a concentrated solution of the p-aminophenol, contacting the resultant concentrated solution with an activated adsorbent carbon at a temperature of from about 80° to about 98°C, separating the solution from the carbon and directly acetylating the p-aminophenol in the solution with acetic anhydride to form N-acetyl-p-aminophenol.

3,917,696

DIHALOGEN-ACETAMINO-BENZYLAMINES AND PROCESS FOR PREPARING THE SAME

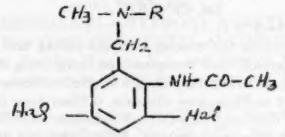
Carlos Ferrer, and Juan Colome, both of Barcelona, Spain, assignors to Laboratories Ferrer S.1., Barcelona, Spain

Filed Sept. 20, 1974, Ser. No. 507,989

Int. Cl.² C07C *103/34*

U.S. Cl. 260—562 R **7 Claims**

1. A compound selected from the group consisting of a compound of the formula



wherein Hal is halogen and R is an adamantyl or cyclohexyl group and the pharmaceutically acceptable nontoxic acid addition salts thereof.

3,917,697

POLYETHERS HAVING OXIDIZED THIOETHER SIDE CHAINS

Hugh A. Farber, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

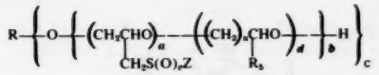
Division of Ser. No. 846,949, Aug. 1, 1969, Pat. No. 3,821,306. This application Dec. 26, 1973, Ser. No. 427,607

The portion of the term of this patent subsequent to June 28, 1991, has been disclaimed.

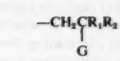
Int. Cl.² C07C *147/02*

U.S. Cl. 260—563 R **8 Claims**

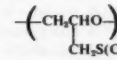
1. The polyether represented by the formula:



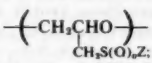
wherein R is hydrogen or the residue of an organic active hydrogen activator selected from the group consisting of monohydric alkyl alcohols, polyhydric alkyl alcohols, hydroxyl terminated polyalkylene polyethers and haloalkyl alcohols; each Z is



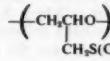
wherein each G is hydroxyl, halogen, $-NR_3R_4$ or $^{+}-NR_3R_4R_6$; R_1 and R_2 are individually hydrogen, alkyl, alkoxy, poly(alkyleneoxy)alkyl, poly(alkylenethio)alkyl; hydroxyalkyl, aryl, aralkyl, cycloalkyl or aryloxy; R_3 and R_4 are individually hydrogen, alkyl, hydroxyalkyl, alkoxyalkyl, poly(alkyleneimino)alkylamine, aryl, aralkyl, alkenyl, alkoxyaryl, aryloxyaryl, aryloxyalkyl or cycloalkyl; each R_5 is hydrogen, alkyl, haloalkyl, mercaptoalkyl, alkoxyalkyl, alkylthioalkyl, aryl, aryloxyalkyl or $—CH_2SZ$; R_6 is hydrogen; a is a positive number sufficient to provide repeating units of



and *d* is 0 or a positive number with the proviso that the ratio of *a* to *d* is such that the polyether contains at least 10 mole percent of



b is a positive integer; *c* is a positive integer from 1 to 8 and n is a positive integer from 1 to 4, *e* of each



is 1 or 2; said polyether having a molecular weight in the range from about 300 up to about 2 million.

3,917,698

POLYFUNCTIONAL QUATERNARY AMIDOXIMIDINIUM SALTS

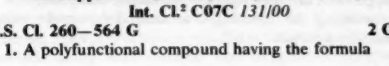
David S. Breslow, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 250,504, May 5, 1972, Pat. No. 3,878,220. This application Jan. 29, 1974, Ser. No. 437,547

Int. Cl.² C07C *131/00*

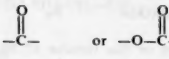
U.S. Cl. 260—564 G **2 Claims**

1. A polyfunctional compound having the formula



wherein R is an organic radical selected from the group consisting of hydrocarbon, halide substituted hydrocarbon, hydrocarbon-oxy-hydrocarbon, hydrocarbon-thio-hydrocarbon, and hydrocarbon-sulfonyl-hydrocarbon radicals, said hydrocarbon radical being selected from the group consisting of alkylene radicals containing 2–18 carbon atoms, arylene radicals containing 1–2 rings, cycloalkylene radicals containing 4–8 carbon atoms, arylene-dialkylene radicals containing 8–10 carbon atoms, alkylene-diarylene radicals containing 13–14 carbon atoms, and cycloalkylene-dialkylene radicals containing 7–8 carbon atoms,

A is



b is zero or 1, NR'R''R''' represents a tertiary organic amine having a dissociation constant greater than 1×10^{-12} as determined at 25°C. and in which R' and R'' are selected from the group consisting of alkyl radicals containing from 1 to 20 carbon atoms and cycloalkyl radicals containing from 5 to 12 carbon atoms, and in which R''' is selected from the group consisting of alkyl radicals containing from 1 to 20 carbon atoms, cycloalkyl radicals containing from 5 to 12 carbon atoms, substituted aryl radicals having 1 to 3 rings, and wherein the substituent is selected from halogen, alkoxy, nitro, cyano and carboalkoxy substituents, alkaryl and aralkyl radicals having 1 to 3 rings in said radicals and 1 to 20 carbon atoms in the alkyl groups, Z is chloride, bromide or iodide, *n* and *m* are 1 to 3, *c* and *d* are zero to 1, with *c* being 1 when *d* is zero, and with *d* being 1 when *c* is zero, and X is the anion of an acid having a dissociation constant greater than 1.0×10^{-3} as determined at 25°C., the number of X's being equal to the number of tert. organic amines when X is mono-valent and being equal to one-half the number of tert. organic amines when X is divalent.

3,917,699

PROCESS FOR THE PRODUCTION OF 2-AMINOCYCLOALKANONE OXIME

Robert Fuhrmann, Morris Plains; Fred W. Koff, Clifton, and John Pisanchyn, Morristown, all of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Dec. 7, 1973, Ser. No. 422,952
Int. Cl.² C07C *131/04*
U.S. Cl. 260—566 A **8 Claims**

1. In a process for the production of 2-aminocycloalkanone oxime wherein hydroxylamine sulfate or hydroxylamine phosphate is admixed with substantially anhydrous ammonia, with exclusion of oxygen from the system, the improvement comprising:

a. removing the precipitated insoluble ammonium salt which forms;
b. adding to the remaining solution at least about 0.2 mol proportion of ammonium chloride;
c. with continued exclusion of oxygen, maintaining the hydroxylamine/ammonia solution containing the ammonium chloride within a temperature range of about 60° to 120°C. while adding 1 mol proportion of 2-chlorocyclohexanone;
d. establishing a reaction temperature in the range of about 80°–120°C. and maintaining the temperature within this range until the reaction is substantially complete; and
e. recovering the resulting 2-aminocyclohexanone oxime reaction product.

3,917,700

NITRONE COMPOUNDS

Melvin Auerbach, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 30, 1974, Ser. No. 438,078
Int. Cl.² C07C *119/00*
U.S. Cl. 260—566 R **1 Claim**

1. The composition of matter selected from the group consisting of 1-(3,5-di-t-butyl-4-hydroxyphenyl)-N-naphthyl nitrone, 1-(3,5-di-t-butyl-4-hydroxyphenyl)-N-phenyl nitrone, 1-(3,5-di-t-butyl-4-hydroxyphenyl)-N-cyclohexyl nitrone, 1-(3,5-di-t-butyl-4-hydroxyphenyl)-N-(3-ethylphenyl)-nitrone, and 1-(3,5-di-t-butyl-4-hydroxyphenyl)-N-tolyl nitrone.

3,917,701

REDUCTION OF CERTAIN 2,2'-DISUBSTITUTED AZOXYBENZENES AND AZOBENZENES TO CORRESPONDING HYDRAZOBENZENES

James L. Cousino, Montague, Mich., assignor to Lakeway Chemicals, Inc., Muskegon, Mich.

Filed Dec. 13, 1972, Ser. No. 314,572
Int. Cl.² C07C *109/04*
U.S. Cl. 260—569 **29 Claims**

1. A method for the production of a 2,2'-disubstituted hydrazobenzene, selected from the group consisting of 2,2'-dichlorohydrazobenzene, 2,2'-dimethylhydrazobenzene, and 2,2'-dimethoxyhydrazobenzene, by the reduction of a compound selected from the group consisting of 2,2'-dichloroazoxybenzene, 2,2'-dichloroazobenzene, 2,2'-dimethylazoxybenzene, 2,2'-dimethylazobenzene, 2,2'-dimethoxyazoxybenzene, and 2,2'-dimethoxyazobenzene, comprising the step of effecting the reduction of the starting disubstituted azoxybenzene or disubstituted azobenzene with finely-divided iron and dilute acid.

3,917,702

METHOD FOR MAKING LIQUID RESINOUS CURING AGENTS FOR EPOXY RESINS AND THE PRODUCTS THEREOF

Frank N. Hirosawa, Monterey Park, Calif., assignor to Furane Plastics Incorporated, Los Angeles, Calif.

Continuation-in-part of Ser. No. 684,926, Nov. 21, 1967, abandoned. This application June 6, 1969, Ser. No. 831,203
Int. Cl.² C07C *87/28*
U.S. Cl. 260—570 D **9 Claims**

1. The process for making a liquid curing and hardening agent for epoxide resin compositions comprising the steps of 1. dissolving an aromatic polyamine selected from the group consisting of m-Phenylene diamine, o-Phenylene diamine, p-Phenylene diamine, 2,5-Diaminotoluene, 1,3-Diaminotoluene, 1,8-Diaminonaphthalene, 4,4'-Methylene dianiline, p-Chloro-o-phenylene diamine, 2,4-Diaminodiphenylamine, 4,4'-Diaminophenylether, 4,4'-Diamino diphenyl sulfone, 4,4'-Diamino benzophenone, 4,4'-Diamino diphenylamine, in a solvent selected from the group consisting of water, isopropyl alcohol, dilute aqueous acid, and dilute aqueous caustic alkali;

2. adding an active aldehyde compound selected from the group consisting of Formaldehyde, Acetaldehyde, Propionaldehyde, Butylaldehyde, n-Valeraldehyde, Caproaldehyde, Caprylicaldehyde, Acrolein, Crotonaldehyde, Tiglic aldehyde, to said solution, the molal ratio of polyamine to aldehyde being in the range from 3/4:1 to 5:1, and maintaining the temperature in the range from 25° to 100°C. until the reaction is complete;
3. removing the water from the reaction mixture;
4. adding an aromatic diamine in equal molal proportion to that used in the initial reaction in steps 1 and 2; and
5. removing the water from the reaction mixture of step 4 by heating under reduced pressure to a temperature of about 150°C. for a period of about one-half to four hours.

3,917,703
4-(AMINOALKYLAMINO)-2-HALOBENZYL LOWER-ALKYL ETHERS

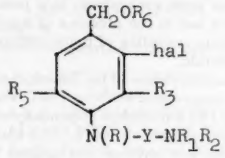
Sydney Archer, Bethlehem, and David Rosi, East Greenbush, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 221,047, Jan. 26, 1972, which is a continuation-in-part of Ser. No. 42,876, June 2, 1970, Pat. No. 3,714,167, which is a continuation-in-part of Ser. No. 664,628, Aug. 31, 1967, Pat. No. 3,558,629, which is a continuation-in-part of Ser. No. 444,848, April 1, 1965, Pat. No. 3,379,620. This application Mar. 21, 1974, Ser. No. 453,502

Int. Cl. C07c *87/48*

U.S. Cl. 260—570.5 P **5 Claims**

1. A compound of the formula:



where hal is halo; R_3 and R_5 are each hydrogen or lower-alkyl; R_6 is lower-alkyl; R is hydrogen or lower-alkyl; Y is polycarbon-lower-alkylene having from two to six carbon atoms inclusive and having its connecting linkages on different carbon atoms; R_1 and R_2 are each hydrogen, lower-alkyl, lower-alkenyl having from three to six carbon atoms or lower-hydroxyalkyl having from 2 to 6 carbon atoms and having its connecting linkage and the hydroxyl group on different carbon atoms; lower-alkyl in each instance having from 1 to 6 carbon atoms and being primary or secondary.

3,917,704
α-AMINOALKYL-4-HYDROXY-3-ALKYLSULFONYLMETHYLBENZYL ALCOHOLS

Carl Kaiser, Haddon Heights, N.J., and Stephen T. Ross, Berwyn, Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

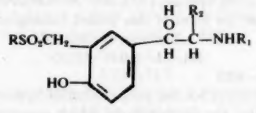
Continuation-in-part of Ser. No. 236,177, March 20, 1972, abandoned. This application May 10, 1973, Ser. No. 359,063

Claims priority, application United Kingdom, Mar. 6, 1973, 10768/73

Int. Cl.² C07C *91/18*

U.S. Cl. 260—570.6 **11 Claims**

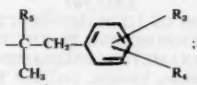
1. A chemical compound of the formula:



or a pharmaceutically acceptable acid addition salt of said compound, wherein:

R is straight or branched chain lower alkyl of from 1 to 5 carbon atoms;

R_1 is branched chain lower alkyl of from 3 to 5 carbon atoms, cycloalkyl or cycloalkylmethyl, the cycloalkyl moiety having from 3 to 6 carbon atoms, or



R_2 is hydrogen, methyl or ethyl;

R_3 and R_4 are hydrogen, hydroxy, or methoxy, and

R_5 is hydrogen or methyl.

3,917,705
PRODUCTION OF SECONDARY ALKYL PRIMARY AMINES

Ronald W. Swanson, Croton-on-Hudson, and Hyung K. Zang, Hopewell Junction, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 26, 1973, Ser. No. 428,553

Int. Cl.² C07C *85/11, 85/00, 87/04*

U.S. Cl. 260—583 M **18 Claims**

1. In a process for producing secondary alkyl primary amines from n-paraffins having from 6 to 30 carbon atoms wherein said n-paraffin is nitrated with a nitrating agent consisting essentially of nitrogen dioxide to form a nitro-paraffin and where said nitroparaffin is hydrogenated to said amine, the improvement which comprises contacting at a temperature of from 270° to 400°F. said n-paraffin and nitrogen dioxide as nitrating agent at a pressure of from about 100 mm. Hg. to about 20 atmospheres in a plurality of reaction zones in series with from 0.03 to 0.4 mole of said nitrating agent per mole of n-paraffin in each of said reaction zones, removing gaseous reaction products and water from the liquid products of each said reaction zones and introducing nitrating agent along with liquid product from the preceding reaction zone into each succeeding reaction zone, thereby effecting conversion of said n-paraffin to nitroparaffin in each of said reaction zones, wherein the total conversion to nitroparaffin in said reaction zones is from 10 weight percent and does not exceed 25 weight percent of said n-paraffin.

3,917,706
PRODUCTION OF SECONDARY ALKYL PRIMARY AMINES

Ralph B. Hudson, Jr., Beacon, and Walter C. Gates, Jr., Newburgh, both of N.Y., assignors to Texaco, Inc., New York, N.Y.

Filed Dec. 26, 1973, Ser. No. 428,641

Int. Cl.² C07C *85/11, 85/00, 87/04*

U.S. Cl. 260—583 M **10 Claims**

1. In a process for producing secondary alkyl primary amines from n-paraffins having from 6 to 30 carbon atoms wherein a portion of said n-paraffin is nitrated to form a nitro-paraffin along with nitrated and oxygenated by-products, where said nitroparaffin is substantially hydrogenated to said amine and where said amine is separated and recovered from a mixture of unreacted paraffin, unconverted nitroparaffin and by-products, the improvement which comprises:

a. hydrogenating said mixture in the presence of a hydrogenation catalyst in a plural stage hydrogenation treatment under a hydrogen pressure of from about 100 to 1500 p.s.i.g. wherein

initial stage hydrogenation of said mixture is conducted at a temperature of from about 250° to 500°F. and

subsequent stage hydrogenation of said mixture is conducted at a temperature of from about 600° to 750°F. and

b. recycling said hydrogenated product of (a) for nitration with said n-paraffin.

3,917,707

SUPPRESSION OF 1,2-DIAMINOCYCLOHEXANE FORMATION DURING PRODUCTION OF HEXAMETHYLENEDIAMINE

John Ronald Williams, Victoria, Tex., and Terry Gene Lenz, Fort Collins, Colo., assignors to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed July 31, 1974, Ser. No. 493,743
Int. Cl.² C07C *87/14*
U.S. Cl. 260—583 K 10 Claims

1. In the preparation of hexamethylenediamine by the catalytic hydrogenation of adiponitrile in the presence of ammonia at a temperature from 25°C. to 210°C. and a pressure of from 25 to 10,000 psig, the improvement comprising contacting the adiponitrile during said hydrogenation with a compound selected from the group consisting of RCOM, where R is selected from hydrogen and alkyl having 1 to 3 carbon atoms and M is selected from the radicals OH, NH_2, ONH_4, ONa and OR′ wherein R′ is selected from alkyl radicals having 1 to 3 carbon atoms, glyoxal and carbon monoxide, the mol percent of RCOM and glyoxal being from 0.2 to 2.4 and carbon monoxide being from 0.075 to 0.150, based on the adiponitrile, and recovering crude hexamethylenediamine with reduced 1,2-diaminocyclohexane.

3,917,708

PRODUCTION OF CYCLOALKANOLS AND CYCLOALKANONES

Albrecht Kuessner, Ludwigshafen, and Guenter Herrmann, Mannheim, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed June 1, 1971, Ser. No. 148,923
Claims priority, application Germany, June 9, 1970, 2028166; Apr. 15, 1971, 2118279
Int. Cl.² C07C *49/30, 35/08*
U.S. Cl. 260—586 R 10 Claims

1. A process of catalytic oxidation of a cycloparaffin for the production of mixtures of cycloalkanols and cycloalkanones which comprises introducing molecular oxygen or an inert gas containing molecular oxygen into a cycloparaffin of from 5 to 12 carbon atoms at a temperature of from 130° to 160°C. and a pressure of from 5 to 25 atmospheres gage and in the presence of an oxidation catalyst consisting essentially of a heavy metal salt soluble in the cycloparaffin, the cation of said salt being selected from the group consisting of cobalt, manganese, copper, iron and nickel and the anion of said salt being selected from the group consisting of monoalkylphosphate, dialkylphosphate, monoalkyl sulfate, alkylsulfonic acid, alkylphosphonate and dialkylphosphinate, each alkyl moiety in the anion being of from 8 to 20 carbon atoms.

3,917,709

ACID-CATALYZED DECOMPOSITION OF ALIPHATIC HYDROPEROXIDES

John O. Turner, Shavertown, and Norman C. Deno, State College, both of Pa., assignors to Sun Ventures, Inc., St. Davids, Pa.

Division of Ser. No. 431,634, Jan. 8, 1974, Pat. No. 3,899,536, which is a continuation-in-part of Ser. No. 98,035, Dec. 14, 1970, abandoned, which is a continuation-in-part of Ser. No. 54,578, July 13, 1970, abandoned. This application Dec. 16, 1974, Ser. No. 532,791
Int. Cl.² C07C *45/00*
U.S. Cl. 260—593 A 3 Claims

1. A process for the preparation of ketones, aldehydes and alcohols which comprises contacting a secondary alkyl hydroperoxide or peroxide containing 3 to 12 carbon atoms at a temperature of from about 0° to 20°C with an acid having a concentration of at least about 70 percent based on the weight of the total reaction mixture, wherein said acid is selected from the group consisting of hydrochloric, sulfuric, oleum, fluorosulfonic and perchloric acid.

3,917,710

PREPARATION OF PHYTONE VIA THE ADDITION OF DIMETHYLKETENE TO 4,8-DIMETHYL-12-OXOTRIDECANAL

David M. Pond, and John G. Thweatt, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 23, 1974, Ser. No. 472,792
Int. Cl.² C07C *45/00*
U.S. Cl. 260—593 R 2 Claims

1. Process for preparing phytone comprising the following series of reactions:

A. cycloaddition of dimethylketene to 4,8-dimethyl-12-oxotridecanal at the aldehyde function to form the dimethylketene β-lactone adduct, said cycloaddition being effected at a temperature of from about 50°C. to about 100°C. in an inert atmosphere, in a polar non-nucleophilic solvent and in the presence of a catalyst selected from the group consisting of boron trifluoride ethereate and zinc chloride;

B. thermal decarboxylation of the dimethylketene β-lactone adduct at a temperature of above 150°C. thereby converting it into 6,10,14-trimethyl-13-pentadecen-2-one; and

C. catalytic hydrogenation of the 6,10,14-trimethyl-13-pentadecen-2-one into phytone said catalyst being selected from the group consisting of palladium on charcoal, Raney nickel or platinum oxide.

3,917,711

NOVEL ATTRACTANT COMPONENTS FOR MALES OF THE TOBACCO BUDWORM MOTH

Wendell L. Roelofs; Ada S. Hill; Thomas C. Baker, and Ring T. Carde, all of Geneva, N.Y., assignors to Research Corporation, New York, N.Y.

Filed Apr. 12, 1974, Ser. No. 460,633
Int. Cl.² C07C *47/20*
U.S. Cl. 260—601 R 2 Claims

1. cis-9-tetradecenal.

3,917,712

PROCESS FOR PRODUCING METHACROLEIN

Albert Bouniot, and Henri Dufour, both of Melle, France, assignors to Rhone-Poulenc Industries, Paris, France

Filed June 29, 1974, Ser. No. 483,139
Claims priority, application France, July 4, 1973, 73.24507
Int. Cl.² C07C *47/20*
U.S. Cl. 260—601 R 1 Claim

1. A continuous process for adiabatically producing by reacting for less than 1 second the vapors of isobutyraldehyde, molecular oxygen, and water vapor in an amount within the range of 35% to 45% by weight of the isobutyraldehyde at a temperature within the range of 150°–300°C, in the presence of silver catalyst, deposited on a silica carrier, and separating the methacrolein produced.

3,917,713

PROCESS FOR PREPARING HYDROXY CITRONELLAL

Peter S. Gradeff, Andover, and Claude Bertrand, Somerset, both of N.J., assignors to Rhodia, Inc., New York, N.Y.

Filed Apr. 28, 1971, Ser. No. 138,358
The portion of the term of this patent subsequent to Mar. 4, 1992, has been disclaimed.
Int. Cl.² C07C *47/26*
U.S. Cl. 260—602 34 Claims

1. In the process for the preparation of hydroxy citronellal from citronellal, the improvement which comprises preparing an enol ester or diester or mixture thereof of citronellal by reaction with a lower alkanoic acid anhydride in the presence of an alkali metal lower alkanoic acid salt; hydrating the resulting enol ester or diester or mixture thereof in the presence of aqueous sulfuric acid having a sulfuric acid concentration within the range from about 58 to 78% at a temperature within the range from about −20° to about 50°C; and then alcoholiz-

ing the hydroxy enol ester or diester to form hydroxy citronellal in the presence of a lower alkanol and a base selected from the group consisting of alkali metal and alkaline earth metal hydroxides, carbonates and bicarbonates, and alkali metal and alkaline earth metal salts of alkane, alkene, cycloalkane, and aryl carboxylic acids, alcohols, mercaptans, phenols, and basic anion exchange resins, in an amount within the range from about 0.01 to about 25% by weight of the hydroxy enol ester.

3,917,714

BIS(ALKYLSULFONYL)VINYLBENZENES

Henry Richmond, Whitehouse Station, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 286,635, Sept. 6, 1972, Pat. No. 3,809,674. This application Feb. 4, 1974, Ser. No. 439,194

Int. Cl.² C07C *147/08*

U.S. Cl. 260—607 A **1 Claim**

1. p-[2,2-bis(ethylsulfonyl)vinyl]anisole.

3,917,715

4-HYDROXY-3,3',4'-TRICHLORODIPHENYL SULPHONE AND ALKALI METAL SALTS THEREOF

Victor Jeffrey Leslie, Potters Bar, and John Brewster Rose, Letchworth, both of England, assignors to Imperial Chemical Industries Limited, London, England

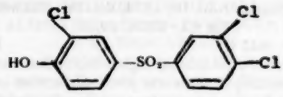
Division of Ser. No. 323,356, Jan. 15, 1973, Pat. No. 3,830,781. This application Apr. 26, 1974, Ser. No. 464,700

Claims priority, application United Kingdom, Jan. 25, 1972, 3437/72

Int. Cl.² C07C *147/10*

U.S. Cl. 260—607 A **1 Claim**

1. A halophenol of the formula



or alkali metal salt thereof.

3,917,716

METHOD FOR RAISING THE CURIE POINT OF FERROMAGNETIC CHROMIUM DIOXIDE

Shin-Ichiro Dezawa, and Tatsuji Kitamoto, both of Odawara Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed May 16, 1973, Ser. No. 361,003

Claims priority, application Japan, May 17, 1972, 47-48919

Int. Cl.² C01G *37/02*

U.S. Cl. 423—607 **12 Claims**

1. A method for raising the Curie point of ferromagnetic chromium dioxide to more than 120°C, which comprises heating ferromagnetic chromium dioxide powder having a Curie point less than 120°C to a temperature more than 60°C in intimate contact with a reducing agent in the gaseous phase, wherein said ferromagnetic chromium dioxide after said heating has X-ray diffraction peaks which show a spacing at at least one of 3.217 ± 0.01A, 2.520 ± 0.004A and 1.718 ± 0.002A and a Curie point more than 120°C.

3,917,717

PREPARATION OF ETHERS OF A PHENOL AND AN ALKYL POLYOL

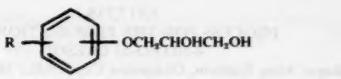
Richard William Griscom, Morristown, Tenn., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation of Ser. No. 201,180, Nov. 22, 1971, abandoned. This application Dec. 6, 1973, Ser. No. 422,183

Int. Cl.² C07C *43/20*

U.S. Cl. 260—613 D **5 Claims**

1. A process for preparing a crystalline ether having the formula:



wherein R is an alkoxy radical having from one to four carbon atoms;

which consists essentially of the sequential steps of:

a. providing a reaction mixture consisting essentially of an alkoxyphenol, having the same alkoxy radical as said crystalline ether; an alkali metal hydroxide; water; toluene; and n-butanol and wherein the volume ratio of toluene to n-butanol is from about 60:40 to about 90:10;

b. refluxing and azeotropically distilling said reaction mixture to form the corresponding alkali metal alkoxy phenate and concomitantly remove a quantity of water equal to about from all of the water in the original reaction mixture to all of the water in the original reaction mixture plus up to 10 mole percent of the water formed by the reaction of said alkoxphenol and said sodium hydroxide while returning the toluene and water butanol to the reaction mixture;

c. combining an amount of a halohydrin, selected from the group consisting of glycerol chlorohydrin and glycerol bromohydrin, stoichiometrically equivalent to the amount of said alkoxphenol with the product mixture of step (b), and refluxing an azeotropically distilling the resulting mixture, to form the corresponding 3alkoxy-phenoxy-1,2-propane-diol and dehydrate the mixture while returning the toluene and n-butanol to the reaction mixture;

d. acidifying the product mixture of step (c) to consume any unreacted alkoxyphenate and azeotropically distilling the acidified mixture to remove any water added during the acidification while returning the toluene and n-butanol to the reaction mixture;

e. removing solid alkali metal halide from the product mixture of step (d); and

f. crystallizing the resulting ether from the liquid product mixture of step (e) comprising toluene and n-butanol and recovering said crystalline ether.

3,917,718

CYCLOPROPYL CARBINOL DERIVATIVES

Joseph C. Collins, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

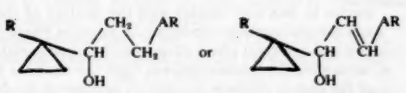
Continuation-in-part of Ser. No. 265,333, June 22, 1972, Pat. No. 3,829,475. This application Jan. 25, 1974, Ser. No. 436,611

Claims priority, application United Kingdom, June 18, 1973, 28793/73

Int. Cl.² C07C *43/20*

U.S. Cl. 260—613 R **7 Claims**

1. A compound of the formula



where R is hydrogen or lower-alkyl of 1 to 4 carbon atoms, and Ar is phenyl, naphthyl or phenyl substituted by from one to three monovalent substituents selected from the group consisting of lower-alkyl of 1 to 4 carbon atoms, lower-alkoxy of 1 to 4 carbon atoms, halogen, trifluoromethyl, trifluoromethoxy, and benzyloxy.

3,917,719

PROCESS FOR THE PREPARATION OF 4-NITRO-M-CRESOL

Roger Allen Baldwin, Oklahoma City, Okla.; Marion Frederick Hawthorne, Los Angeles, and Ming Tzu Cheng, Buena Park, both of Calif., assignors to Kerr-McGee Chemical Corporation, Oklahoma City, Okla.

Continuation-in-part of Ser. No. 43,180, June 3, 1970, abandoned. This application June 8, 1973, Ser. No. 368,295

Int. Cl.² C07C *79/26*

U.S. Cl. 260—622 R **4 Claims**

1. The process which comprises simultaneously introducing separate streams of 1 mole of m-cresol and 1.18 to 2.0 moles of a nitrosating agent into a mineral acid solution selected from the group consisting of hydrochloric and sulfuric acid to produce 4-nitroso-m-cresol suspended in the acid, said nitrosating agent being selected from the group consisting of alkali and alkaline earth metal nitrites; said acid solution having an initial normality within the range of 2.5 to 7.5, being present in an amount sufficient to provide from about 3.3 to 8.0 moles of hydrogen ion for each mole of m-cresol introduced and from about 2.4 to 4.0 moles of hydrogen ion for each mole of nitrosating agent introduced; agitating the mixture at a temperature of from about −5° to +10°C and thereafter warming the suspension of 4-nitroso-m-cresol and maintaining the temperature of the suspension at from about 20° to 40°C. while adding separate streams of sodium nitrate and nitric acid to oxidize the 4-nitroso-m-cresol to 4-nitro-m-cresol; said sodium nitrate being added in an amount equivalent to the unconsumed hydrogen ion and the nitric acid being added in sufficient quantity to provide a total apparent nitric acid molality in the range of about 2 to 4 and a total molar ratio of nitric acid to m-cresol in the range of 3.0 to about 4.2.

3,917,720

CONTINUOUS PROCESS FOR THE PRODUCTION OF A DIOL FROM A DIOL ESTER

Jimmy L. Webb, Ballston Lake; John E. Corn, and R. Thomas Swiger, both of Schenectady, all of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed May 30, 1973, Ser. No. 365,229

Int. Cl.² C07C *29/00, 29/24, 31/18*

U.S. Cl. 260—635 R **8 Claims**

1. A continuous process for the production of an acetate-free diol from a lower alkane diol acetate by hydrolysis which comprises the steps of:

a. reacting a lower alkane diol acetate and from about one to about 50 moles of water per mole of the diol acetate in a reactor at a temperature of from about 25°C to about 90°C in the presence of an acidic cationic exchange material to produce an equilibrium mixture of water, acetic acid, a lower alkane diol and a lower alkane diol acetate;

b. feeding the equilibrium mixture into a column where the acetic acid and water are removed producing a mixture of a lower alkane diol and a lower alkane diol acetate;

c. feeding the mixture of a lower alkane diol and a lower alkane diol acetate into a countercurrent extractor;

d. introducing water and an inert organic solvent which dissolves the unhydrolyzed acetates and is immiscible with water and the diols into the countercurrent extractor to mix and contact with the mixture of the diol and the diol acetate, producing an aqueous phase of the diol and a solvent phase of an unhydrolyzed acetate;

e. separating the organic solvent from the aqueous phase of the diol to produce an aqueous solution of the diol;

f. passing the solvent phase containing an unhydrolyzed acetate into a column to separate the organic solvent and the unhydrolyzed acetate, which solvent is recycled to the countercurrent extractor of (d);

g. recycling the unhydrolyzed acetate into the reactor of (a);

h. passing the aqueous solution of the diol from (e) into a column to remove the water and produce an acetate-free diol.

3,917,721

OLEFIN HYDRATION USING PHOSPHORIC ACID ON POROUS SILICA XEROGEL

Orville D. Frampton, Wyoming, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed Dec. 17, 1973, Ser. No. 425,437

Int. Cl.² C07C *29/08*

U.S. Cl. 260—641 **12 Claims**

1. In a process of hydrating olefins to the corresponding alcohols by contacting the olefin and water vapor with a catalyst at elevated temperatures and pressures, the improvement which comprises employing as the catalyst, a H_3PO_4 impregnated silica xerogel, wherein said xerogel has a particle size passing through 3 mesh and retained on 20 mesh, a bulk density of 0.38–0.48 g/cc, a pore volume of 0.80–2.2 ml/g with 19–100% of the pores as micropores (diameter 600 A), a BET surface area in the range of 200–500 m^2/g, an average crush strength of 50 particles being not less than 4.4 pounds and has the following chemical composition in terms of weight percent dry basis: SiO_2 over 99%; Fe_2O_3 0.01–0.03%; Na_2O 0.02–0.09%; and Al_2O_3 less than 0.4%.

3,917,722

PROCESS FOR CONDENSATION OF ALCOHOLS

James E. Yates, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Division of Ser. No. 350,264, April 11, 1973, abandoned. This application Nov. 18, 1974, Ser. No. 524,600

Int. Cl.² C07C *29/00*

U.S. Cl. 260—642 C **10 Claims**

1. A process for producing higher molecular weight alcohols by condensing at least one lower molecular weight primary alkanol having a methylene group adjacent to the hydroxylated carbon atom said process being carried out in liquid phase at about 80° to about 300°C in the presence of an alkali catalyst and an organic zinc compound, said alkali catalyst being an alkali metal, alkali metal hydroxide, alkali metal oxide, alkali metal bisulfite or alkali metal hydrocarbon alcoholate and said organic zinc compound beng defined by $(R'''—SO_3)_2$ Zn

wherein R''' is a saturated or unsaturated, cyclic or acyclic, branch or straight chain hydrocarbon group, while simultaneously removing water as it forms.

3,917,723

PROCESS FOR THE CONTINUOUS MANUFACTURE OF M-CHLORONITROBENZENE FROM M-DINITROBENZENE

Norbert Szczepanski, and Konrad Baessler, both of Frankfurt am Main, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Nov. 12, 1973, Ser. No. 414,632

Claims priority, application Germany, Nov. 16, 1972, 2256167

Int. Cl.² C07C *79/12*

U.S. Cl. 260—646 **7 Claims**

1. A process for the manufacture of m-chloronitrobenzene by partial chlorinating denitration of m-dinitrobenzene, which comprises continuously introducing chlorine into a melt of m-dinitrobenzene under a pressure of 250 torr to atmospheric pressure and continuously separating the reaction products, the pressure of the system being smaller than the vapor pressure of m-chloronitrobenzene but greater than the vapor pressure of m-dinitrobenzene.

3,917,724
PROCESS FOR PREPARING OLIGOMERS OF HEXAFLUOROPROPENE

Thomas Martini, Neuenhain (Taunus), Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt (Main), Germany

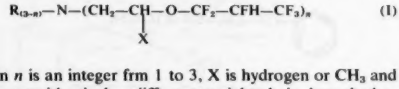
Continuation-in-part of Ser. No. 440,568, Feb. 7, 1974, abandoned. This application Apr. 23, 1974, Ser. No. 463,389

Claims priority, application Germany, Feb. 9, 1973, 2306439; Jan. 10, 1974, 2401018

Int. Cl.² C07C *17/26*

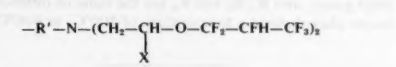
U.S. Cl. 260—653.1 R **16 Claims**

1. A process which comprises contacting hexafluoropropene at a temperature of −20° to 100°C with a fluorine-containing tertiary amine having the formula



(I)

wherein n is an integer frm 1 to 3, X is hydrogen or CH_3 and R represents identical or different straight-chain, branched or cyclic alkyl groups of from 1 to 12 carbon atoms or, if n is 2, additionally represents the group



wherein R′ is an alkylene group of from 1 to 12 carbon atoms.

3,917,725
PROCESS FOR INSERTION OF HEXAFLUOROPROPENE AT THE ALIPHATIC CARBON-HYDROGEN BOND OF A HYDROCARBON

Robert Neville Haszeldine, Disley, and Ronald Rowland, Warrington, both of England, assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Jan. 5, 1973, Ser. No. 321,161

Claims priority, application United Kingdom, Jan. 14, 1972, 1988/72

Int. Cl.² C07C *17/26, 19/08*

U.S. Cl. 260—653.1 R **3 Claims**

1. A process for inserting hexafluoropropene into the structure of a hydrocarbon compound containing at least one aliphatic carbonhydrogen bond and which is free of acetylenic and terminal ethylenic unsaturation, said hydrocarbon compound being selected from the class consisting of alkanes and non-terminal alkenes, said insertion of hexafluoropropene being at said carbon-hydrogen bond, which comprises contacting said hydrocarbon compound with hexafluoropropene monomer at a temperature in the range of about 160°C to about 350°C, and at a pressure of about 1 to about 250 atmospheres, in the absence of free oxygen-containing gases and free-radical catalyst.

3,917,726
PROCESS FOR PREPARING PERFLUORO-2-METHYL-PENTANE

Sigmar-Peter von Halasz, Kelkheim, Taunus, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

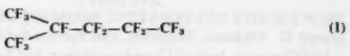
Filed June 20, 1974, Ser. No. 481,462

Claims priority, application Germany, June 23, 1973, 2332088

Int. Cl.² C07C *17/04*

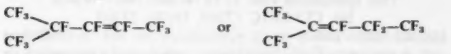
U.S. Cl. 260—653.9 **3 Claims**

1. Process for preparing perfluoro-2-methyl-pentane



(I)

wherein perfluorohexenes of the formulae



(II) (III)

or their mixtures in liquid phase are reacted with elementary fluorine at temperatures of from −30° to −120°C.

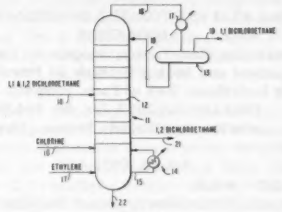
3,917,727
VINYL CHLORIDE PROCESS

Utah Tsao, Jersey City, N.J., assignor to The Lummus Company, Bloomfield, N.J.

Filed Aug. 16, 1974, Ser. No. 498,083

Int. Cl.² C07C *21/02*

U.S. Cl. 260—656 R **14 Claims**



1. A process for producing vinyl chloride, comprising:

chlorinating ethane in a reaction zone to produce an effluent comprising vinyl chloride, 1,2-dichloroethane, ethylene and 1,1-dichloroethane; recovering vinyl chloride from said effluent; recovering ethylene from said effluent; recovering a mixture comprising 1,1-dichloroethane and 1,2-dichloroethane from said effluent; introducing said mixture into a fractionation zone operated at temperatures and pressures to separate 1,1-dichloroethane and 1,2-dichloroethane; introducing recovered ethylene and chlorine into the fractionation zone; reacting said recovered ethylene and said chlorine in said fractionation zone to produce 1,2-dichloroethane; recovering separated 1,1-dichloroethane in a first stream withdrawn from said fractionation zone; and recovering separated 1,2-dichloroethane introduced as feed and produced from the chlorination of recovered ethylene in a second stream withdrawn from said fractionation zone.

3,917,728
PURIFICATION OF VINYL CHLORIDE

Ronnie D. Gordon, Richardson, Tex., assignor to Continental Oil Company, Ponca City, Okla.

Continuation-in-part of Ser. No. 311,187, Dec. 1, 1972, abandoned. This application Sept. 26, 1974, Ser. No. 509,371

Int. Cl.² C07C *21/06*

U.S. Cl. 260—656 R **12 Claims**

1. A process for the purification of vinyl chloride containing minor amounts of butadiene which comprises intimately contacting said impure vinyl chloride with a highly acidic silica-alumina catalyst, selected from the group consisting essentially of synthetic silica-alumina catalysts and acidic naturally-occurring clays used in the catalytic cracking of petroleum, at a temperature in the range of 50° to 250°C.

3,917,729

PROCESS FOR DEUTERATING BROMIDE DERIVATIVES

Joseph G. Atkinson, Montreal, and Patrice Belanger, Dollard Des Ormeaux, both of Canada, assignors to Charles E. Frosst & Co., Canada

Continuation of Ser. No. 121,124, Aug. 4, 1971, abandoned. This application Feb. 7, 1974, Ser. No. 440,616

Int. Cl.[2] C07C *17/00, 19/00, 23/00*

U.S. Cl. 260—658 R 3 Claims

1. A process wherein a mixture consisting of a secondary or tertiary alkyl bromide or a cycloalkyl bromide wherein the bromide atom is attached to the secondary or tertiary carbon atom and at least 10% deuteriobromic acid in deuterium oxide is permitted to react under atmospheric pressure and at a temperature from 0° to about 175°C. for a sufficient number of exchanges to exchange all hydrogens of the secondary or tertiary alkyl bromide or the cycloalkyl bromide by deuterium atoms.

3,917,730

NEW CATALYST FOR THE DIMERIZATION OF DIOLEFINS

Igor Tkatchenko, Pau, France, assignor to Union Chimique Elf-Aquitaine and Institut Francais du Petrole, des Carburants et Lubrifiants, both of Paris, France

Filed Oct. 10, 1973, Ser. No. 404,888

Claims priority, application France, Oct. 10, 1972, 72.35766

Int. Cl. C07c *3/10*

U.S. Cl. 260—666 B 9 Claims

1. A process for the dimerization of diolefins of up to about 10 carbon atoms in liquid phase which comprises contacting said diolefin in solution in an inert solvent at a temperature between 0°–100° C. with a dimerization catalytic amount of up to about 1 weight percent of a catalyst which is the interaction product of a first and a second metallic complex, each of said complexes containing at least one of nitrosyl and carbonyl ligands and said interaction product containing at least one nitrosyl group, wherein said first metallic complex is a sodium n-carbonyl-p-nitrosyl metallate of the formula $Na_m[M^1(CO)_n.(NO)_p]$, in which M^1 is a transition metal of Group VB, VIB, VIIB or VIII of the Periodic Table, *n* and *p* are integers of 0–5, the sum of $n + p$ is 1–6, and m is an integer of 1–5, and wherein said second metallic complex is a r-carbonyl-s-nitrosyl halide of the formula $Xq[M^2(CO)_r(NO)_s]$ in which M^2 is a transition metal of Groups VB, VIB, VIIB or VIII of the Periodic Table, X is halogen, cyanide, sulfocyanide, isocyanate, nitrate, nitrite, sulfate, acetylacetonate or carboxylate, *r* and *s* are integers of 0–5, *q* is an integer of 1–5, the sum of $r + s$ is 1–6, and wherein *p* and *s* are not simultaneously 0.

3,917,731

PROCESS FOR PRODUCING DIALKYLTETRALINS

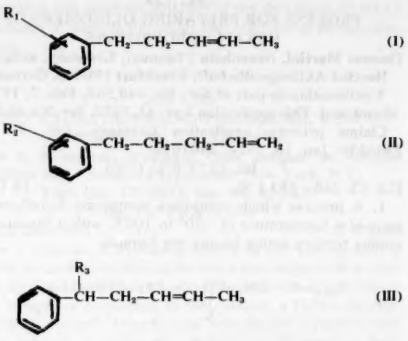
Takanori Urasaki; Isao Oka; Makoto Ogasawara, and Takeo Shima, all of Iwakuni, Japan, assignors to Teijin Limited, Japan

Filed Aug. 9, 1974, Ser. No. 495,763

Int. Cl. C07c *15/24*

U.S. Cl. 260—668 F 3 Claims

1. A process for preparing dialkyltetralins which comprises contacting an alkenylbenzene selected from compounds of the following formula



wherein R_1 and R_2 are a group selected from the class consisting of methyl, ethyl and isopropyl groups, R_3 is a methyl or ethyl group, and R_1, R_2 and R_3 are the same or different, with boron phosphate at a temperature of 100°C. to 400°C.

3,917,732

METHOD OF OXYDEHYDROGENATION OF ALKYL AROMATIC COMPOUNDS

G. Edwin Vrieland, Midland, Mich., and Hans R. Friedli, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 28, 1974, Ser. No. 474,124

Int. Cl.[2] C07C *5/48*

U.S. Cl. 260—669 R 10 Claims

1. A method of oxydehydrogenating ethyl benzene to form styrene comprising feeding a mixture of from about 0.5 to about 4.0 moles of oxygen per mole of ethyl benzene into contact with a catalyst consisting essentially of magnesium nickel pyrophosphate having from about 6 to about 9.5 atoms of magnesium per atom of nickel at a reaction temperature of from about 450° to about 650°C., and a space velocity of from about 55 to about 2500 and recovering the styrene from the effluent.

3,917,733

ADSORBENT TREATING PROCESS FOR BOTH A LIQUID AND A GASEOUS HYDROCARBON STREAM

George R. Winter, III, Des Plaines, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Apr. 4, 1974, Ser. No. 457,739

Int. Cl.[2] C07C *7/12*

U.S. Cl. 260—674 SA 14 Claims

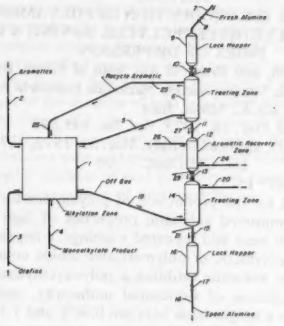
1. A process for the continuous operation of a treating process utilizing a non-regenerative solid adsorbent capable of treating a gaseous stream after it has become incapable of treating a liquid stream which comprises:

a. passing a liquid hydrocarbon stream containing a first halogen-containing chemical through a first treating zone containing a non-regenerative solid adsorbent to effect the removal of at least a portion of the first halogen-containing chemical;

b. switching the flow of the liquid hydrocarbon stream to a second treating zone containing additional non-regenerative solid adsorbent after the non-regenerative adsorbent in the first treating zone is substantially incapable of adsorbing additional amounts of the first halogen-containing chemical; and,

c. passing a gaseous stream containing a second halogen-

containing chemical through the non-regenerative adsorbent in the first treating zone to effect a removal of at



least a portion of the second halogen-containing chemical.

3,917,734
PROCESS FOR THE SEPARATION OF ETHYLBENZENE

Armand J. deRosset, Clarendon Hills, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Apr. 8, 1974, Ser. No. 459,251
Int. Cl.[2] C07C 7/12
U.S. Cl. 260—674 SA **12 Claims**

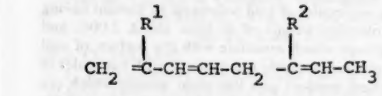
1. A process for separating ethylbenzene from a feed mixture comprising ethylbenzene and a plurality of xylene isomers which comprises contacting said mixture with a crystalline aluminosilicate adsorbent consisting essentially of X or Y zeolite containing at the exchangeable cationic sites within said zeolite from about 2 to about 15 wt. % calcium, said zeolite also containing from about 0.2 to about 3 wt. % H_2O measured by loss on ignition at 500°C., selectively adsorbing substantially all of said xylene isomers in said adsorbent to the substantial exclusion of the ethylbenzene, and recovering a high-purity ethylbenzene raffinate.

3,917,735
PROCESS FOR MAKING 1,3,6-OCTATRIENES BY DIMERIZATION

Klaus-Jurgen Ploner, Greifensee, Switzerland, assignor to Givaudan Corporation, Clifton, N.J.

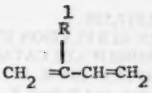
Filed Jan. 30, 1974, Ser. No. 438,084
Claims priority, application Switzerland, Feb. 2, 1973, 1553/73
Int. Cl.[2] C07C 11/00, 11/21
U.S. Cl. 260—677 R **9 Claims**

1. A process for the manufacture of unsaturated compounds of the general formula



(I)

wherein R^1 and R^2 represent a lower alkyl or lower alkenyl group,
which process comprises reacting a compound of the general formula



(II)

wherein R^1 has the significance given earlier in this claim, or mixtures of compounds of formula II at temperatures within the range from 50°C. to 200°C., with a material selected from the group consisting of a compound of the formula $(R_3SiO)_4Zr$ and $(R_3SiO)_3VO$ and a compound of the formula AlR_2X, in which X represent a halogen atom and R is selected from the group consisting of a lower alkyl, cycloalkyl, phenyl and a phenyl-(lower alkyl) group and in which the R-symbols can be different from one another, "lower" meaning a group having up to 7 carbon atoms.

3,917,736
OXIDATIVE DEHYDROGENATION OF 2,3-DIMETHYL-BUTENES TO 2,3-DIMETHYLBUTADIENE

Kenneth J. Frech, Tallmadge; Frederick H. Hoppstock, Massillon, and David A. Hutchings, Stow, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed June 21, 1974, Ser. No. 481,583
Int. Cl.[2] C07C 5/48
U.S. Cl. 260—680 E **6 Claims**

1. The method of preparing 2,3-dimethylbutadiene by the oxidative dehydrogenation of 2,3-dimethyl-1-butene or 2,3-dimethyl-2-butene or mixtures thereof which comprises contacting at least one hydrocarbon selected from the group consisting of 2,3-dimethyl-1-butene and 2,3-dimethyl-2-butene with a catalyst consisting of cobalt molybdate or cobalt molybdate treated with potassium hydroxide in amounts from about 0.5 to about 2 percent by weight of the cobalt molybdate, in the presence of an oxidant in an amount to provide an oxygen/hydrocarbon mole ratio ranging from 0.5/1 to 5/1, at a temperature range from 350°C to 650°C and at an LHSV of from 0.5 to 10.

3,917,737
CATALYTIC HYDROGENATION PROCESS

Jin Sun Yoo, South Holland, Ill., assignor to Atlantic Richfield Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 53,677, July 9, 1970, abandoned. This application Sept. 28, 1972, Ser. No. 293,002
Int. Cl. C07c 5/02
U.S. Cl. 260—683.9 **22 Claims**

1. In a process for the catalytic hydrogenation of hydrogenateable material having carbon-to-carbon unsaturation wherein said material is contacted under hydrogenation conditions with molecular hydrogen in the presence of a catalyst, the improvement which comprises contacting said hydrogenateable material with hydrogen at a temperature of from about −40°to about 300°F. in the presence of a catalyst comprising a minor catalytically effective amount of a complex of

A. a metal selected from iron, cobalt, nickel and mixtures thereof, and

B. an organometallic reducing agent of the formula $M(R)_n$ wherein M is a Group IA, IIA, IIB, IIIA or IVA metal, n is 1 to 4 and satisfies the valence of M, and each R is selected from hydrogen and hydrocarbyl, provided at least one R is hydrocarbyl; supported on a major portion of

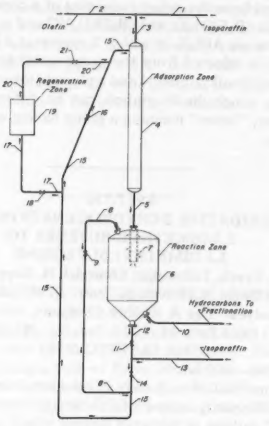
C. an acidic, solid, silica-based and inorganic oxide support wherein the mole ratio of (B) to (A) is from about 5 to 20:1 and the complex is prepared by the interaction of (A) and (B) at a temperature of from about −20°F. to about 150°F.

3,917,738

ISOPARAFFIN-OLEFIN ALKYLATION UTILIZING CRYSTALLINE ALUMINOSILICATE CATALYST IN AN ADSORPTION ZONE

Ellsworth R. Fenske, Palatine, and Robert F. Anderson, La Grange Park, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed May 16, 1974, Ser. No. 470,413
Int. Cl.[2] C07C 3/52
U.S. Cl. 260—683.43 9 Claims



1. An alkylation process which comprises passing a mixture of isoparaffin, olefin and crystalline aluminosilicate catalyst through an adsorption zone at adsorption conditions including a temperature of from about 70° to about 250°F., a catalyst residence time of from about 0.1 to about 5 minutes and a hydrocarbon residence time of from about 0.5 to about 10 minutes, adsorbing substantially all of said olefin in said catalyst during the passage of said mixture through said zone, then discharging the mixture into an alkylation zone maintained at alkylation conditions including an alkylation temperature of from about 70° to about 250°F., a catalyst residence time of from about 0.25 to about 4 hours and a hydrocarbon residence time of at least about 1 minute and therein reacting the olefin adsorbed in the catalyst with a portion of said isoparaffin, separately withdrawing from the alkylation zone an alkylate-containing stream, a catalyst-containing stream and an unreacted isoparaffin-containing stream, commingling said withdrawn isoparaffin-containing stream and said catalyst-containing stream and supplying said commingled streams to said adsorption zone.

3,917,739

PARAFFIN HYDROISOMERIZATION PROCESS

R. Parthasarathy, Silver Spring, and James Michael Maselli, Columbia, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Aug. 9, 1973, Ser. No. 387,074
Int. Cl.[2] C07C 5/30
U.S. Cl. 260—683.65 1 Claim

1. A process for hydroisomerization of paraffins, having from 4 to 7 carbon atoms per molecule, at a temperature of 400° to 650°F., a pressure of 300 to 500 psig. and a hydrogen to hydrocarbon mole ratio of 3 to 1 to 10 to 1, by contacting said paraffins with a catalyst comprising from about 0.1 to 1.5 weight percent of a metal selected from the group consisting of platinum and palladium and from about 0.1 to 5 weight percent cerium oxide, said platinum or palladium homogenously dispersed as crystallites in the 5 to 30 Angstrom size range, the metal being dispersed into hydrogen form mordenite by contacting the base with a mixed solution of platinum or palladium nitrate and cerium nitrate followed by controlled calcination and reduction with hydrogen at a temperature of 500° to 900°F.

3,917,740

METHOD FOR THE PRODUCTION OF POLYAMIDES BY ADDING POLYETHYLENEGLYCOL HAVING A LOW INDEX OF DISPERSION

Francesco Siclari, and Bruno D'Alo, both of Milan, Italy, assignors to Snia Viscosa Societa Nazionale Industria Applicazioni Viscosa S.p.A., Milan, Italy

Filed Mar. 28, 1973, Ser. No. 345,536
Claims priority, application Italy, Mar. 31, 1972, 22748/72
Int. Cl.[2] C08L 77/00
U.S. Cl. 260—857 PG 7 Claims

1. A method for the production of polyamides for textile usage having improved antistatic properties of high persistence in spite of wear and repeated washings, comprising

adding to a polymeric or polymerizable amide compound, as the sole antistatic additive a polyoxyethyleneglycol, under conditions of substantial uniformity, and in an amount on a weight basis between 0.40% and 1.5%, said polyoxyethylene glycol having an average molecular weight in the order of 20,000 with all the molecules close to that weight, and high uniformity as defined by an index of molecular dispersion between 1.02 and 1.2

3,917,741

METHOD OF MAKING POLYURETHANE POWDER

John J. McGarr, Beverly, Mass., assignor to USM Corporation, Boston, Mass.

Continuation-in-part of Ser. Nos. 263,658, June 16, 1972, Pat. No. 3,817,886, and Ser. No. 278,611, Aug. 7, 1972, Pat. No. 3,787,525. This application May 9, 1973, Ser. No. 358,476
The portion of the term of this patent subsequent to Jan. 22, 1991, has been disclaimed.
Int. Cl.[2] C08L 75/00
U.S. Cl. 260—859 R 10 Claims

1. The method for preparing polyurethane resins directly in finely divided form from reaction of a first reactant comprising at least one organic polyisocyanate with a second reactant comprising at least one organic compound containing at least two groups having active hydrogen to form a solid reaction product, said first reactant being employed in amount relative to the amount of said second reactant to give a molar ratio of active hydrogen to —NCO in the range of from about 0.85:1 to ablut 1.15:1, said method comprising the steps of emulsifying, said active hydrogen compound reactant in liquid form with the aid of a polymeric surfactant as fine droplets in a continuous phase comprising an organic liquid inert to and less polar than said reactant and in which at least said one reactant and said solid reaction product are substantially insoluble and the other of said reactants is miscible, said surfactant being present in amount of from about 0.1% to about 10% on the weight of emulsified insoluble liquid reactant, dissolving said miscible reactant in said inert organic liquid, reacting said emulsified insoluble reactants with said miscible dissolved reactant by interfacial reaction between the droplets of said emulsified reactant and dissolved reactant in said inert organic liquid under conditions of vigorous agitation to form fine particles of said polyurethane separable from said inert liquid by settling, and separating said particles from said inert liquid, the molecules of said polymeric surfactant having an average molecular weight of at least about 2,000, and having polar groups which associate with the surface of said droplets of emulsified insoluble reactant and with particules of said solid reaction product and less-polar groups which are solvated by the said inert organic liquid, the quantity and the balance of polar to less-polar groups of said surfactant relative to the polarities of said inert organic liquid, said insoluble emulsified liquid reactant and said reaction product providing that the total association of less polar groups with said inert

organic liquid is greater than the total association of the polar groups with said emulsified insoluble reactant and with said solid reaction product by an amount to ensure that said inert liuqid will be the external phase, but is less than the amount which would interfere with formation of a fine emulsion of the insoluble liquid reactant in said inert organic liquid, coordinating (a) the intensity of said agitation; (b) the quantity and the balance of polar to less-polar groups of said surfactant in said emulsion and (c) the polarities of said inert organic liquid, said emulsified insoluble liquid reactant and said reaction product to form a fine emulsion in which at least about 95% by weight of the droplets of said emulsified liquid reactant will be in the range of from 1 to 300 microns in diameter so that the particles of reaction product will settle, the association of said surfactant with said reaction product holding said surfactant on the surface of said particles of reaction product to impede agglomeration of said particles.

3,917,742

HYDROXYLATED AND CHLORINATED BLOCK COPOLYMER BLENDS

James T. Harlan, Jr., Torrance, Calif., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 417,348, Nov. 19, 1973. This application Aug. 9, 1974, Ser. No. 495,973

Int. Cl.[2] C08L *75/00, 55/04*

U.S. Cl. 260—859 R **4 Claims**

1. A composition comprising:

1. 4–25% by weight of a chlorinated and hydroxylated block copolymer in a volatile solvent therefor; and
2. 75–96% by weight of a supplementary polymer of the group consisting of polyurethanes, polychloroprenes, polystyrenes, block copolymers of monoalkenyl arenes and conjugated dienes and hydrogenated products of said block copolymers, said chlorinated and hydroxylated block copolymers comprising at least two polymer blocks of at least one monoalkenyl arene and at least one chlorohydrinated polymer block of the group consisting of polymerized conjugated dienes and hydrogenated polymer blocks of conjugated dienes, the chlorine and hydroxyl radicals directly attached to carbon atoms of the polymeric chain, the weight ratio of chlorine to hydroxyls being between about 0.5 to 5.0, the chlorine content being 1–15% by weight of the copolymer.

3,917,743

COPOLYETHERESTER BLENDS

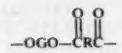
Herman Elbert Schroeder, Hockessin, and James Richard Wolfe, Jr., Wilmington, both of Del., assignors to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed Mar. 7, 1974, Ser. No. 448,995

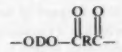
Int. Cl.[2] C08L *67/00*

U.S. Cl. 260—860 **13 Claims**

1. A substantially uniform blend having a melting point of at least 100°C. composed of (A) 50–95 percent by weight of a copolyetherester having a DSC melting point of at least 120°C. and consisting essentially of a multiplicity of recurring long-chain ester units and short-chain ester units joined head-to-tail through ester linkages, said long-chain ester units being represented by the formula

I 

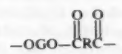
and said short-chain units being represented by the formula

II 

where G is a divalent radical remaining after the removal of terminal hydroxyl groups from a poly(tetramethylene oxide) glycol having a molecular weight of about 400 to 6000; R is a divalent radical remaining after removal of carboxyl groups from a dicarboxylic acid or derivative thereof having a molecular weight less than about 300 and D is a divalent radical remaining after removal of hydroxyl groups from a diol having a molecular weight less than about 250, provided said short-chain ester units amount to about 15–95% by weight of said copolyetherester and (B) 50–5 percent by weight of polymeric softener selected from the group consisting of (1) polyetherester units represented by the formula

I

where G is a divalent radical remaining after the removal of terminal hydroxyl groups from a poly(tetramethylene oxide) glycol having a molecular weight of about 400 to 6000; and R is a divalent radical remaining after removal of carboxyl groups from dicarboxylic acid having a molecular weight of less than about 300 and (2) copolyetherester compositions consisting essentially of a multiplicity of recurring long-chain ester units and short-chain ester units joined head-to-tail to ester linkages, said long-chain ester units being present in an amount of at least 15% by weight and being represented by the formula

I 

and said short-chain units being represented by the formula

II

where G is a divalent radical remaining after the removal of terminal hydroxyl groups from a poly(tetramethylene oxide) glycol having a molecular weight of about 400 to 6000; R is a divalent radical remaining after removal of carboxyl groups from a dicarboxylic acid having a molecular weight less than about 300 and D is a divalent radical remaining after removal of hydroxyl groups from a diol having a molecular weight less than about 250, with the proviso that said component (B) must have an inherent viscosity of more than about 0.3 as measured in m-cresol at 30°C. and a DSC melting point of less than 0°C.

3,917,744

TERTIARY-ALIPHATIC α-(PERACYL)AZO COMPOUNDS AS INITIATORS FOR THE POLYMERIZATION OF UNSATURATED POLYESTERS AND VINYL MONOMERS

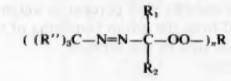
Ronald Edward MacLeay, Williamsville, and Chester Stephen Sheppard, Tonawanda, both of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 88,109, Nov. 9, 1970, Pat. No. 3,830,797, which is a continuation-in-part of Ser. No. 725,180, April 29, 1968, abandoned, which is a continuation of Ser. No. 616,158, Feb. 15, 1967, abandoned, which is a continuation of Ser. No. 409,306, Nov. 5, 1964, abandoned. This application Mar. 13, 1974, Ser. No. 450,639

Int. Cl.[2] C08L *67/06;* **C07C** *107/02*

U.S. Cl. 260—861 **6 Claims**

1. In a process for the homo- or copolymerization of ethylenically unsaturated monomers which are responsive at suitable temperatures to free radical generators as polymerizaation initiators, the improvement which comprises employing as free radical generator t-aliphatic α-(peracyl)azo compounds of the formula



where:

$(R'')_3C$ is a C_4–C_{20} tertiary alkyl, cycloalkyl, arylcycloalkyl, alkylcycloalkyl or aralkyl group where each R'' is separately selected from C_1–C_8 alkyl, C_6–C_{14} aryl or C_7–C_{12} aralkyl, not more than one R'' being aromatic, and 2 or 3 of said R''s when taken together with the t-carbon atom form a cyclo-, bicyclo-, or tricycloalkyl radical of 3–12 carbons;

n is 1 or 2;

R is $-C(=O)R_3$, $-C(=O)OR_4$, $-C(=O)N(R_3)_2$, $-C(=O)OOR_5$, $-C(=O)SR_4$, $-C(=O)Cl$, $-C(=O)R_6C(=O)-$, $-C(=O)OR_6OC(=O)-$, $-C(=O)OOR_6OOC(=O)-$, $-C(=O)N(R_3)R_6N(R_3)C(=O)-$, $-C(=O)SR_6SC(=O)-$ or $-C(=O)-$;

R_1 and R_2 are C_1–C_8 alkyl, C_3–C_{12} cyclo-, bicyclo- or tricycloalkyl or alkylcycloalkyl, C_7–C_{12} aralkyl, or 5–6 membered heterocyclic, or R_1 and R_2 taken together form a C_3–C_{11} alkylene diradical, and R_1 can also be C_6–C_{14} aryl;

R_3 is selected from hydrogen and C_1–C_{12} alkyl, C_6–C_{14} aryl, C_7–C_9 aralkyl or C_3–C_8 cycloalkyl;

one or more of each of R_1, R_2 and R_3 can be substituted with radicals selected from lower alkoxy, hydroxy, carboxy, lower alkoxycarbonyl, lower acyloxy, halo, cyano, amido and lower alkylsulfonato;

R_4 is C_1–C_{12} alkyl, C_6–C_{14} aryl, C_7–C_{12} aralkyl or C_3–C_{10} cycloalkyl or alkylcycloalkyl;

R_5 is C_4–C_8 t-alkyl or C_9–C_{12} t-aralkyl; and

R_6 is a C_1–C_{12} alkyl, alkoxyalkyl, alkynyl or alkenyl, C_3–C_{10} cycloalkyl or alkylcycloalkylalkyl, or C_6–C_{14} aryl, alkylaralkyl or aralkylaryl diradical.

3,917,745

COUPLED PEROXIDES AS CROSSLINKING INITIATORS

Antonio Joseph D'Angelo, Buffalo; Orville Leonard Mageli, and Chester Stephen Sheppard, both of Kenmore, all of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

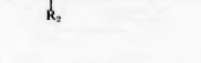
Division of Ser. No. 342,106, March 16, 1973, Pat. No. 3,846,386, which is a division of Ser. No. 737,359, June 7, 1968, Pat. No. 3,725,455. This application June 25, 1974, Ser. No. 482,943

Int. Cl.[2] C08J *3/24;* **C08K** *5/14*

U.S. Cl. 260—861 **3 Claims**

1. In the process of crosslinking unsaturated polyester composition using as the crosslinking agent a free radical affording compound, the improvement which comprises using as said agent a peroxide of the formula R—W—R' where:

a. W is selected from $-C(=O)-$, $-C(=O)R^4C(=O)-$, $-C(=O)C(=O)-$,



b. R and R' are identical and are selected from $R_5OO-C(R_1)(R_2)-R^3O-$, $(R_5OO)_2C(R_4)-R^2O-$, $R_5OOC(=O)R^3O-$, $R_5OOC(=O)OR^3O-$, $R_1OC(=O)OO-C(R_1)(R_2)-R^2O-$, and $R_1C(=O)OO-C(R_1)(R_2)-R^2O-$;

c. R_1 and R_2 are aliphatic having 1–12 carbon atoms, cycloaliphatic having 3–12 carbon atoms, or aromatic having 6–12 carbon atoms;

d. R_3 is aliphatic or cycloaliphatic, each having 4–10 carbon atoms and the carbon atom joined to the peroxy oxygen atom is a tertiary carbon atom;

e. R_4 is aliphatic having 1–10 carbon atoms or cycloaliphatic having 3–12 carbon atoms;

f. R_5 is lower alkyl, cycloalkyl, aralkyl, aryl, alkoxy, cycloalkoxy, aralkoxy, or aryloxy;

g. R_6 is H or lower alkyl;

h. Y is the diradical O, S, or N—R_6;

j. R^2 is an aliphatic diradical having 1–10 carbon atoms or a cycloaliphatic diradical having 3–12 carbon atoms;

k. R^3 is an aliphatic diradical having 1–10 carbon atoms, cycloaliphatic diradical having 3–12 carbon atoms, aromatic diradical having 6–12 carbon atoms, or araliphatic diradical having 7–16 carbon atoms;

l. R^4 is selected from R^3, YR^3Y, $R^3C(=O)YR^3YC(=O)R^3$, $YR^3YC(=O)YR^3YC(=O)YR^3Y$, $YR^3YC(=O)R^3C(=O)YR^3Y$, $YR^3C(=O)YR^3C(=O)YR^3Y$, $YR^3C(=O)YR^3YC(=O)R^3Y$, $YR^3YC(=O)YR^3Y$, $YR^3YC(=O)R^3Y$ and YR^3YR^3Y; and

m. R_7 and R_8 are selected from H, alkyl of 1–10 carbons and cycloalkyl of 3–12 carbons and, when R_7 is H, R_8 can also be aryl of 6–12 carbons, and R_7 and R_8 when taken together form alkylene of 2–11 carbons.

3,917,746

IMPACT RESISTANT POLYMER COMPOSITIONS

Itsuho Aishima, Tokyo; Hisaya Saurai, Kawasaki; Atsushi Kitaoka, and Yoshihiko Katayama, both of Nobeoka, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 699,303, Jan. 22, 1968, abandoned. This application May 17, 1971, Ser. No. 144,242

Claims priority, application Japan, Feb. 2, 1967, 42-6294

Int. Cl. C08f *29/12*

U.S. Cl. 260—876 B **3 Claims**

1. An ethylene/propylene block copolymer composition having an excellent impact resistance at low temperatures consisting essentially of 70–95% by weight of an ethylene/propylene block copolymer having an ethylene content of 0.5–8.0% by weight, said block copolymer consisting of a statistical ethylene/propylene copolymeric block and a propylene homopolymeric block which are arranged in an optical recurring cycle and containing no terminal polyethylene block, said block copolymer being substantially insoluble in n-heptane and being formed by supplying ethylene intermittently to a polymerization system in which propylene is being polymerized in the presence of a stereospecific polymerization catalyst, and 5–30% by weight of a polyethylene having a density not lower than 0.94 at 23°C. and prepared by a low or medium pressure process.

3,917,747
METHOD OF PRODUCING CYCLOPENTENE COPOLYMER

Shoichi Matsumura; Hiroshi Wakabayashi; Toru Nakagawa, and Shigeru Fujii, all of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Aug. 8, 1974, Ser. No. 495,629
Claims priority, application Japan, Aug. 11, 1973, 48-90280
Int. Cl.² C08F *2/06, 4/52, 4/22, 232/04*
U.S. Cl. 260—879 **10 Claims**

1. Method of producing copolymer of cyclopentene, comprising the steps of

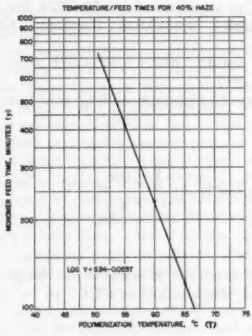
A. polymerizing cycloolefin having more than 7 membered ring and at least two double bonds in the ring unconjugated to each other, using a catalyst comprising at least a metal compound of tungsten or molybdenum and Lewis acid; and

B. copolymerizing the cycloolefin polymer obtained in step (A) and cyclopentene by adding into the polymerization solution of of step (A) cyclopentene and an organo metallic compound of a metal of Group I–IV of the Periodic Table.

3,917,748
PROCESS FOR MANUFACTURE OF RUBBER-MODIFIED COPOLYMERS OF AN OLEFINIC NITRILE AND A VINYL AROMATIC MONOMER

Bennett Frank Vincent, Jr., Chesterland, and James L. O'Kane, Northfield, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed May 31, 1973, Ser. No. 365,591
Int. Cl.² C08L *9/00, 47/00*
U.S. Cl. 260—880 R **6 Claims**



1. In the process for the manufacture of nitrile resins by reacting 100 parts by weight of:

A. at least 50% by weight of at least one nitrile having the structure

$$CH_2 = \underset{R}{C} - CN$$

wherein R is hydrogen, a lower alkyl group having from 1 to 4 carbon atoms or a halogen, and

B. up to 50% by weight based on the combined weight of (A) and (B) of a vinyl aromatic selected from the group consisting of styrene and alpha-methyl styrene,

in the presence of from about 1 to 40 parts by weight of (C) a preformed rubbery polymer of a conjugated diene monomer selected from the group consisting of butadiene and isoprene, and at least one member selected from the group consisting of a vinyl aromatic as defined in (B) and a nitrile as defined in (A), wherein said rubbery polymer contains from 50 to 95% by weight of polymerized conjugated diene, and the remainder being polymerized vinyl aromatic and/or polymerized olefinic nitrile, wherein said reaction is conducted in an aqueous medium comprising water, an emulsifier and a free-radical polymerization initiator, in the substantial absence of molecular oxygen, the improvement comprising:

adding substantially all of the monomers (A) and (B) simultaneously to the preformed rubbery polymer (C) at a rate no greater than that designated by the formula:

$$\log y = 5.54 - 0.053\ T$$

wherein T represents the polymerizing temperature in °C and y represents the minimum time in minutes for co-adding monomers (A) and (B) to (C), within the temperature range of from 40° to 75°C to obtain a polymer having acceptable optical clarity.

3,917,749
RESINOUS BUTADIENE/STYRENE REINFORCING COPOLYMERS

LLoyd D. Hess, Cuyahoga Falls, and William C. Mast, Stow, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 14, 1973, Ser. No. 425,008
Int. Cl.² C08L *9/08*
U.S. Cl. 260—880 R **3 Claims**

1. Butadiene/styrene copolymer reinforcing resins prepared by a two step polymerization process comprising the steps of (A) polymerizing, under aqueous emulsion polymerization conditions, a first monomeric mixture consisting of from 5 to 15 parts by weight of butadiene monomer and from 95 to 85 parts by weight of styrene monomer, all parts based on the total weight of the combined monomers polymerized in step (A) to obtain a first butadiene/styrene copolymer latex and (B) adding to and polymerizing in said first butadiene/styrene copolymer latex a second monomeric mixture consisting of from 20 to 35 parts by weight of butadiene monomer and from 80 to 65 parts by weight of styrene monomer, all parts based on the total weight of the combined monomers polymerized in step (B) wherein the ratio of the total weight of the combined monomers in step (A) to the total weight of the combined monomers in step (B) ranges from 75/25 to 25/75 and wherein the monomeric mixture polymerized in step (A) ranges from 5 to 32 percent by weight higher in styrene content than the monomeric mixture added and polymerized in step (B).

3,917,750
POLYTETRAHALOBENZENE DICARBOXYLIC ANHYDRIDES

James O. Knobloch, Naperville, Ill., assignor to Standard Oil Company, Chicago, Ill.

Division of Ser. No. 434,953, Jan. 21, 1974, Pat. No. 3,873,506. This application Sept. 5, 1974, Ser. No. 503,301
Int. Cl.² C08K *5/09;* **C08L** *35/00*
U.S. Cl. 260—890 **4 Claims**

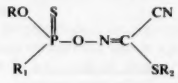
1. A composition comprising a major amount of a thermoplastic addition polymer and a minor amount of a resinous polytetrahalobenzenedicarboxylic anhydride, wherein the carboxylic groups are meta or para to each other.

3,917,751
THIONO-PHOSPHORIC(PHOSPHONIC) ACID ESTER FORMALDOXIMES

Hellmut Hoffman, Wuppertal-Elberfeld; Wolfgang Behrenz, Cologne-Stammheim, and Ingeborg Hammann, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 5, 1971, Ser. No. 186,815
Claims priority, application Germany, Oct. 13, 1970, 2050090
Int. Cl.² A01N 9/36; C07F 9/165, 9/40
U.S. Cl. 260—940 7 Claims

1. Thionophosphoric(phosphonic) acid ester formaldoximes of the general formula



in which

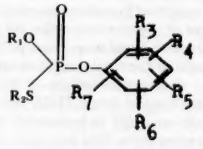
R and R_2 each is an alkyl radical with 1–6 carbon atoms, and R_1 is an alkyl or alkoxy radical with 1–6 carbon atoms.

3,917,752
0-ALKYL-5-ALKYL-0-(SUBSTITUTED PHENYL)THIOLPHOSPHATES

Jozef Drabek, Allschwil, Switzerland; Manfred Böger, Haltingen, Germany, and Odd Kristiansen, Mohlin, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 27, 1974, Ser. No. 455,458
Claims priority, application Switzerland, Apr. 3, 1973, 4737/73; Mar. 5, 1974, 3154/73
Int. Cl.² A01N 9/36; C07F 9/18
U.S. Cl. 260—949 5 Claims

1. A compound of the formula



wherein

R_1 represents methyl or ethyl,

R_2 represents n-propyl, isopropyl, isobutyl or sec.-butyl,

R_3 represents methylthio,

R_4 represents hydrogen, chlorine, bromine, methyl or nitro, and

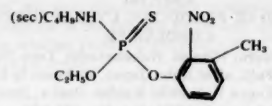
R_5 R_6 and R_7 each represent chlorine, bromine or methyl.

3,917,753
PHOSPHOROTHIONOAMIDATES

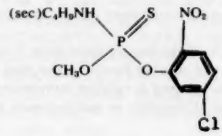
Takeo Satomi, Nishinomiya; Naganori Hino, Toyonaka; Ryo Yoshida, Minoo, and Kunio Mukai, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Dec. 13, 1973, Ser. No. 424,311
Claims priority, application Japan, Dec. 15, 1975, 47-126630; Dec. 15, 1975, 47-126631
Int. Cl.² C07F 9/24
U.S. Cl. 260—954 3 Claims

1. A phosphorothionoamidate of the formula:



3. A phosphorothionoamidate of the formula:

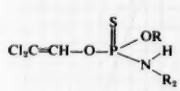


3,917,754
DICHLOROVINYLTHIONOPHOSPHORIC ACID ESTER AMIDES

Wilhelm Sirrenberg, Sprockhovel, I; Bernard Homeyer, Opladen; Ingeborg Hammann, Cologne, and Wilhelm Stendel, Wuppertal-Elberfeld, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 267,759, June 30, 1972, abandoned. This application Sept. 30, 1974, Ser. No. 510,835
Claims priority, application Germany, July 3, 1971, 2133200
Int. Cl.² A01N 9/36; C07F 9/24
U.S. Cl. 260—957 7 Claims

1. A dichlorovinylthionophosphoric acid ester amide of the formula



in which

R is methyl, isopropyl, isobutyl or sec.-butyl, and

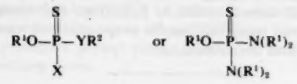
R_2 is methyl, ethyl, propyl or allyl.

3,917,755
PRODUCTION OF S-AMMONIUM PHOSPHORIC ACID ESTERS AND THIOLO-PHOSPHORIC ACID ESTERS FROM THIONO-PHOSPHORIC ACID ESTERS

Hans G. Franke, Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 317,479, Dec. 21, 1972, Pat. No. 3,832,425. This application Sept. 24, 1973, Ser. No. 400,288
The portion of the term of this patent subsequent to Aug. 13, 1991, has been disclaimed.
Int. Cl.² C07F 9/24, 9/165
U.S. Cl. 260—987 7 Claims

1. A process for preparing S-ammonium salts of thionophosphoric acid esters which comprises reacting a thionophosphoric acid ester of the formula



wherein R^1 is alkyl of 1 to 6 carbon atoms or alkenyl of 3 to 6 carbon atoms, Y is oxygen or sulfur, R^2 is alkyl or 1 to 6 carbon atoms or alkenyl of 3 to 6 carbon atoms and X is amino, N-alkylamino of 1 to 6 carbon atoms, N,N-dialkylamino of 2 to 10 carbon atoms or N-alkanoylamino of 2 to 10 carbon atoms, which comprises reacting said ester with an ammonium sulfide or polysulfide in liquid phase at a temperature from about 10°C. to 100°C.

3,917,756

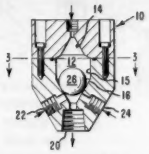
APPARATUS FOR MIXING GAS AND LIQUID

Warren Wesley Rice, Wrightsville Beach, N.C., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed June 11, 1974, Ser. No. 478,400

Int. Cl.² B01F *3/04*

U.S. Cl. 261—18 B **3 Claims**



1. An apparatus for mixing a gas with a liquid comprising: an elongated body member having a chamber defined by upper and lower conical portions connected by a cylindrical portion; said upper and lower conical portions each terminating in an apex, there being an inlet passage leading into said upper conical portion and an outlet passage leading from the apex of the lower conical portion and at least one other passage leading into said lower conical portion; a ball located within said chamber and free to move from sealing contact with said lower to sealing contact with said upper conical portions; a source of pressurized gas connected to said inlet passage; and a source of pressurized liquid connected to said other passages in said lower conical portion, said pressure of said gas and said liquid being in balance whereby the liquid enters the chamber and causes the ball to rotate and carry a film of liquid on its surface to be contacted by the gas for continuously mixing the liquid with the gas, the gas/liquid mixture then exits the chamber through said outlet.

3,917,757

PORTABLE HUMIDIFIER CASE CONSTRUCTION

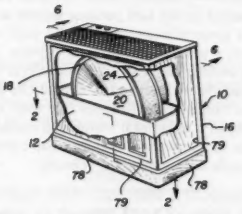
Kip J. Hoag, Concord, Mich., assignor to McGraw-Edison Company, Elgin, Ill.

Filed Mar. 13, 1974, Ser. No. 450,798

Int. Cl.² B01F *3/04*

U.S. Cl. 261—30 **1 Claim**

1. A portable humidifier combination comprising a case, water container, and a humidifying mechanism; said case being formed of four separate plastic side wall panels meeting at corner junctures thereof, three of the adjacent case side wall panels having between adjacent pairs of side panels interlocking tongue and groove means and cooperating interlocking detent means at the respective corner junctures thereof operable to orient and to hold the adjacent panels relative to one another in a generally U-shaped subassembly, the remaining one case side wall panel being separably connected to this subassembly of three case side wall panels to define a generally tubular configuration and means for releasably securing the one case side wall panel in place, said case further having spaced openings for the inlet and outlet of ambient air and an internal air flow path therebetween, said inlet opening being formed in the one side wall panel and open grill structure integral with the one side wall panel transversely across the opening, fan means supported directly from the one side wall panel inwardly adjacent the grill means operable for moving ambient air from the inlet through the case and out the outlet, a cylindrical cowl integral with the one side wall panel and surrounding the air inlet opening and the fan means, said one case wall panel further having integrally defined therewith inwardly extended wall portions and an inwardly offset connecting wall portion which define a cavity open to the side of the wall panel opposite the tubular configuration, and control means in the cavity for operating the humidifying mechanism; the container being located in the case and being readily separable therefrom; and said humidifying mechanism being disposed in part in the water container and in part in the air



flow path but being supported solely from the one case wall panel and being operable thereon for electrical and mechanical checking of operation with the one case wall panel separated from the U-shaped subassembly, said humidifying mechanism including a drum and a circumferential mat of porous material supported thereon, and supporting means for the drum including a pair of horizontally spaced rollers mounted from the one side wall panel and a pair of horizontally spaced anti-friction means disposed also on the one side wall panel whereby the drum is supported solely by the rollers and the anti-friction means, said one case side wall panel also having formed integrally therewith a semi-cylindrical cowl projected inwardly from said wall panel in closely spaced concentric adjacent relation with the supported drum and a ledge between opposite ends of the semi-cylindrical cowl, whereby the cowls and ledge serve to direct air flow to within the case and through the humidifying mechanism mat and to minimize leakage past the drum and case.

3,917,758

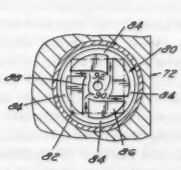
CARBURETOR ACCELERATING PUMP SYSTEM FUEL ATOMIZER

Alvin E. Huff, Northville, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed May 9, 1974, Ser. No. 468,791

Int. Cl.² F02M *7/08*

U.S. Cl. 261—34 A **1 Claim**



1. A fuel enrichment control device for the accelerating pump system of a carburetor having an air/fuel induction passage open at one end to air at ambient pressure and connected at its other end to an engine intake manifold to be subject to the changes in vacuum therein, the induction pas-

sage including a fuel discharge port means supplying fuel under pressure at times to the discharge port, the pump system including a fuel pump connected by passage means to the port and actuated in response to opening movement of the carburetor throttle valve to deliver fuel to the port, the control device comprising fuel atomizing means connected to the discharge port for receiving the pumped fuel and discharging the fuel into the induction passage in a finely atomized state promoting mixing of the fuel with the air in the induction passage to effect maximum fuel vaporization and thereby a reduction in fuel enrichment requirements during vehicle accelerations, the fuel atomizing means comprising a vortex generator including a vortex cavity having an axial fuel outlet and a radially outward tangential off-center fuel inlet inducing spinning and increased velocity to the fuel, the vortex generator including an annular member having an axial discharge nozzle of a first predetermined diameter at one end constituting the fuel outlet, a radially outer torodial fuel flow inlet chamber connected to the fuel passage means at the opposite end, the vortex generator connecting the inlet chamber and nozzle, the vortex generator having a tubular shape with a number of circumferentially spaced peripheral flow passages extending essentially parallel to the axis of the generator and constituting the tangential off-center fuel inlet connecting to the vortex cavity in a tangential manner to induce vortex flow around the axis of the vortex chamber for central discharge through the nozzle with increased velocity.

3,917,759

DOMESTIC HUMIDIFIER

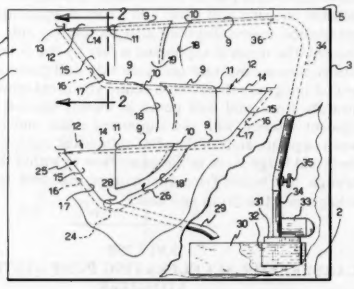
Andre Martin, 38 Stewart St., Kapuskasing, Ontario, Canada

Filed Jan. 30, 1974, Ser. No. 437,770

Claims priority, application Canada, Oct. 9, 1973, 182926

Int. Cl.[2] B01F *3/04*

U.S. Cl. 261—36 R **10 Claims**



1. A domestic water humidifier comprising a hollow body defining an upwardly and rearwardly inclined front wall having serially connected troughs and transversely steep strip portions formed therein with the troughs laterally alternating with the transversely steep strip portions and upwardly separated by the latter laterally in step-like manner, each trough having an outside guard wall being slightly inclined in its longitudinal direction relative to the inclination of any adjacent trough, and defining an upstream portion and a downstream portion, each transversely steep strip portion having one end portion forming a steep incline extending transversely thereof and cascading from the downstream portion of one trough to the upstream portion of a subjacent trough and in series with the associated one trough and subjacent trough for free water circulation serially along the troughs in open air exposure and for evaporation in the air, said front wall forming a drain cavity in communication with the downstream portion of the lowermost trough, a water outlet operatively associated to the upstream portion of the uppermost trough to feed water thereto, and power-actuated means for recirculating water from the drain cavity to said water outlet, whereby water will circulate in zigzag manner on said front wall in said troughs and will form a series of falls from one trough to another along said steep inclines for evaporation of water off said front face into the ambient air.

3,917,760

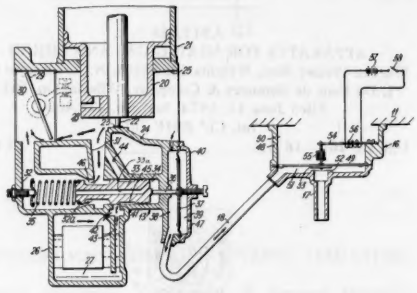
CARBURETTERS FITTED TO INTERNAL COMBUSTION ENGINES

Peter Phillimore Swatman, Solihull, England, assignor to British Leyland (Austin-Morris) Limited, Birmingham, England

Filed Jan. 25, 1974, Ser. No. 436,650

Int. Cl.[2] F02M *1/12*

U.S. Cl. 261—39 B **4 Claims**



1. A vehicle engine fuel system comprising:

1. a temperature-sensitive device adapted to provide an output signal which varies from a first to a second value in inverse proportion to engine operating temperature, the first value corresponding to normal engine operating temperature, the second value corresponding to low engine operating temperature;

2. a carburetter of the constant depression or constant velocity type having a housing defining a duct and a throttle disc dividing said duct into a region of constant depression upstream of said disc and an induction region downstream of said disc, said carburetter further comprising:

a. a passage by-passing said disc and providing communication between said constant depression region and the duct downstream of the throttle disc;

b. enrichment means connected to said temperature-sensitive device and comprising a plurality of orifices communicating with said passage, which orifices are connected, when open, to admit fuel or a mixture of fuel and air into said passage, and a pressure balanced valve in said passage which is adapted to control the degree of communication between said constant depression region and said duct downstream of the throttle disc in dependence on the value of said output signal by at least partially opening and closing at least one of said orifices.

3,917,761

PROCESS OF MAKING A POROUS POLYIMIDE SHAPED ARTICLE

Edwin Louis Scheuerlein, and Frank Clyde Starr, Jr., both of Wilmington, Del., assignors to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Division of Ser. No. 360,582, May 15, 1973. This application Dec. 3, 1974, Ser. No. 529,077

Int. Cl.[2] C08J *9/24, 9/02, 9/26*

U.S. Cl. 264—41 **5 Claims**

1. A method of manufacture for fabricating porous polyimide shaped articles which comprises pressing a preform by subjecting a composition of a coalescible polyimide powder

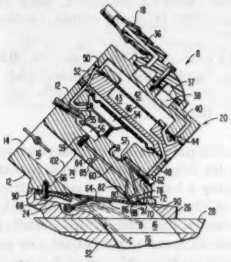
and a solid particulate polymer of formaldehyde to a forming pressure of at least about 10,000 psi and heating said preform to a temperature above about 300°C. to sinter said preform and provide a porous polyimide shaped article having interconnecting pores.

3,917,762

CARBURETOR AND METHOD OF CARBURATION

Dale Herbrandson, 1605 Lynngrove Drive, Manhattan Beach, Calif. 90266

Filed Mar. 19, 1974, Ser. No. 452,654
Int. Cl.² F02M 9/10
U.S. Cl. 261—62 **7 Claims**



2. A carburetor apparatus operable to supply air and fuel to engine means and comprising:

induction passage means having
an air receiving inlet and
a fuel and air discharging outlet;

fuel supplying orifice means communicating with said induction passage means and operable to discharge fuel thereinto;

flexible reed valve means extending transversely across said induction passage means, said flexible reed valve means being concurrently operable to

throttle the flow of air through said induction passage means in response to operation of engine throttle control means,

prevent a reverse flow of air through said induction passage means from the outlet thereof toward the inlet thereof, and

induce aspiration of fuel from said fuel supplying orifice means into said induction passage means;

throttle linkage means operable to be connected with said engine throttle control means;

throttle movement limiting means operable to define selectively variable throttling positions of said flexible reed valve means with respect to said induction passage means and said fuel supplying orifice means; and

means mounting said throttle movement limiting means on said throttle linkage means to cause said throttling action of said flexible reed valve means, as determined by selective positioning of said throttle movement limiting means, to be responsive to operation of said engine throttle control means.

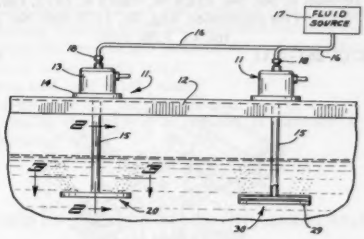
3,917,763

AERATOR

James P. Schafer, Minneapolis, Minn., assignor to Frank D. Werner, Jackson, Wyo.

Continuation of Ser. No. 286,236, Sept. 5, 1972, abandoned. This application Sept. 4, 1974, Ser. No. 503,101
Int. Cl.² B01F 3/04
U.S. Cl. 261—87 **7 Claims**

1. A device for dispersing a fluid into a liquid, comprising a disc like member, means to mount said disc like member for rotation about an axis, said disc like member extending outwardly from said axis and comprising a pair of spaced top and bottom walls joined at their outer peripheral edges to form an enclosed chamber, a depending peripheral flange extending below the bottom wall, a source of fluid, a conduit open from said source of fluid to said chamber, a plurality of openings



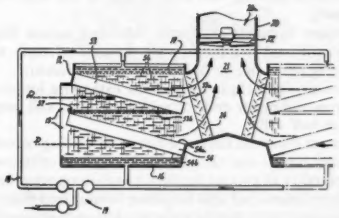
defined substantially only in said top wall through which fluid may pass from the chamber to the liquid as said disc is rotated, and at least one opening through said bottom wall within the area defined by said peripheral flange.

3,917,764

SLOPED FILM FILL ASSEMBLY COOLING TOWER

Peter M. Phelps, 15 Buckeye Way, Kentfield, Calif. 94904

Filed Jan. 26, 1973, Ser. No. 327,154
Int. Cl.² E04H 5/12
U.S. Cl. 261—111 **11 Claims**



1. A tower for contacting liquid and gas comprising at least one upright side wall having a gas inlet opening, means for supplying gravitating liquid to the upper portion of the tower, a gas outlet opening, film fill means mounted in said tower having opposed upper and lower surfaces, said film fill means having a principal plane inclined at an angle of between about **20°** and **70°** to the vertical and also disposed to intersect a gas path extending between said gas inlet and outlet openings, said upper surface being disposed below said liquid supply means to intersect liquid gravitating therefrom, said lower surface being in communication with said gas inlet opening and said upper surface being in communication with said gas outlet opening, a major portion of said film fill means being at the same elevation as said gas inlet opening, said film fill means comprising a plurality of sheets mounted so that adjacent sheets are sufficiently spaced apart for the passage of gas along said path and of liquid gravitating from said liquid supply means, said film fill means being formed to spread liquid gravitating onto said upper surface into a thinner, more uniform film at said lower surface, and splash-type fill disposed between said film fill means and said liquid supply means to provide increased liquid distribution onto the film fill means, said sheets being essentially vertically disposed to provide an essentially vertical path to the liquid.

3,917,765

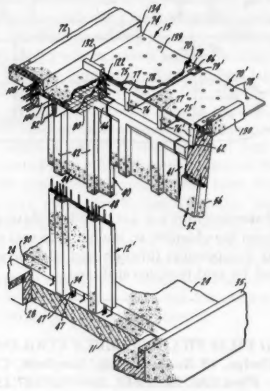
CONCRETE COOLING TOWER

Donn B. Furlong, San Rafael; Harry W. Gobler, and Robert Grotheer, both of Santa Rosa, all of Calif., assignors to Ecodyne Corporation, Lincolnshire, Ill.

Division of Ser. No. 232,830, March 8, 1972, Pat. No. 3,779,523. This application Aug. 30, 1973, Ser. No. 392,896

Int. Cl. F28c *1/00*

U.S. Cl. 261—111 4 Claims



1. In a cooling tower structure including a plurality of precast concrete wall panels positioned above a concrete foundation so as to form a plurality of transverse wall sections defining cooling cells therebetween and a plurality of longitudinal wall sections dividing said cells in half; a top deck structure comprising:

a. precast concrete T beams extending across the upper ends of said transverse wall sections of each half cell having spray nozzle openings formed therein;

b. precast concrete ledger beams extending longitudinally across the upper ends of said transverse wall sections of each half cell;

c. precast concrete keystone beams extending between said ledger beams associated with facing half cells; and

d. a plurality of precast fandeck panels supported upon said ledger beams and said keystone beams, said panels being shaped so as to define a fan stack opening therethrough.

3,917,766

MANUFACTURE OF OPTICAL ELEMENTS

Harry Howden, Salfords, near Redhill, England, assignor to U.S. Philips Corporation, New York, N.Y.

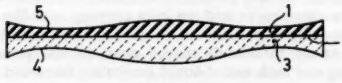
Filed Nov. 13, 1972, Ser. No. 306,344

Claims priority, application United Kingdom, Nov. 25, 1971, 54807/71

The portion of the term of this Patent subsequent to Apr. 8, 1992, has been discalimed.

Int. Cl.[2] B29D *11/00*

U.S. Cl. 264—1 6 Claims



1. A method of manufacturing an aspheric light-transmissive optical element, comprising the steps of supporting a light-transmissive elastically deformable flat substrate with one surface above a mold surface that has a profile which is the negative of a required optical profile, filling the space between said surfaces with a light-transmissive adhesive shrinkable plastic material having approximately the same refractive index as the substrate, curing the plastic material to form a molded layer adhered to both said surfaces and, due to shrinkage, to elastically deform said substrate, optically working flat the other, outer, surface of the deformed substrate, and releasing the substrate with the molded layer adhered thereto from the mold surface whereby said substrate resumes at least partially its original undeformed condition thus forming together with said molded layer said optical element.

3,917,767

PROCESS FOR THE PREPARATION OF MULTIPLE-BASE PROPELLANT POWDER

Johannes Eich, and Heinrich Brachert, both of Troisdorf, Germany, assignors to Dynamit Nobel Aktiengesellschaft, Germany

Filed Oct. 16, 1974, Ser. No. 515,402

Claims priority, application Germany, Oct. 16, 1973, 2351778

Int. Cl.[2] C06B *21/00*

U.S. Cl. 264—3 C 20 Claims

1. A process for the preparation of spherical, multiple-base propellant powder for firearms having a low permissible maximum pressure, having a base of nitric acid esters of cellulose, which comprises utilizing a mixture of nitrocellulose and at least one nitrate selected from the group consisting of glycerin trinitrate and glycol dinitrate as propellant raw material, said mixture containing from 80 to 95 weight % nitrocellulose and from 5 to 20% of the nitrate; agitating said raw material and a stabilizer for said material dissolved in a water-immiscible first solvent under water to effect formation of a lacquer containing said raw material and said raw material and said stabilizer in said solvent within an aqueous system, the weight ratio of said mixture dissolved in said first solvent to said first solvent being from 10 : 2 to 10 : 4; segregating the thus-produced lacquer into a plurality of particles by the addition of a protective colloid and an alkaline salt; allowing the lacquer particles to flow together again by subsequently changing the agitation speed of the aqueous system and thereupon adding once more protective colloid and salt and again segregating the lacquer to form spherical particles of propellant powder by adjusting the agitating speed of the aqueous system to approximately the value at which the first segregation of the lacquer has taken place; and, after the second segregating step is finished, removing more than one-half of the solvent by distillation; adding from 0.6 to 4% by weight of burn control moderators based on the weight of said raw material dissolved in a second water immiscible solvent to said aqueous system; and subsequently, removing the remaining portion of water-immiscible solvents from said aqueous system, said moderators being coated on said spherical particles of said propellent powder.

3,917,768

SINTERED NUCLEAR FUEL AND METHOD OF PREPARING SAME

Giancarlo Abate-Daga, and Ignazio Amato, both of Turin, Italy, assignors to Fiat Societa per Azioni, Turin, Italy

Division of Ser. No. 885,524, Dec. 16, 1969, Pat. No. 3,759,786. This application Feb. 15, 1973, Ser. No. 332,835

Claims priority, application Italy, Feb. 25, 1969, 50722/69

Int. Cl.[2] G21C *21/00*

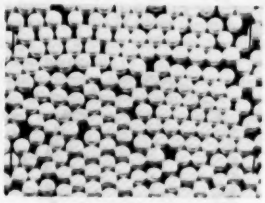
U.S. Cl. 264—.5 5 Claims

1. A method of preparing a sintered nuclear fuel comprising a sintered mixture of uranium dioxide particles and consumable nuclear poison particles uniformly distributed therein, and wherein said poison is a rare earth oxide, said method comprising the steps of:

a. preparing microcapsules of the said poison of 10–2000 microns in diameter by gelling droplets of a sol of a hydroxide of the rare earth in a dehydrating liquid essentially consisting of a long-chain alcohol to form microcapsules, washing the gelled microspheres, heating the mi-

crospheres sufficiently to increase their density to at least 96% of the theoretical density, and then further heating the microcapsules to substantially the maximum temperature to be used in the sintering in step (e) hereof;

b. coating the microspheres obtained in step (a) with molybdenum metal by fluidizing said microspheres in an atmosphere consisting of an inert gas and molybdenum



hexacarbonyl vapor at an elevated temperature thereby to deposit molybdenum metal on the surface of the microspheres; .

c. mixing the coated microspheres obtained in step (b) with ceramic grade uranium dioxide powder;

d. pressing the mixture of coated microcapsules and uranium dioxide powder into pellets; and

e. sintering the pellets under a hydrogen blanket.

3,917,769

PROCESS FOR THE PREPARATION OF ELECTRODES FOR AN ELECTROCHEMICAL GENERATOR

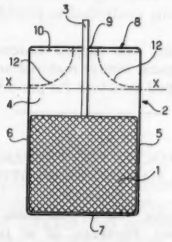
Robert Gadessaud, Massy, and Claudette Audry, Issy Les Moulineaux, both of France, assignors to Compagnie Generale D'Electricite, Paris, France

Filed Nov. 5, 1973, Ser. No. 413,141

Claims priority, application France, Nov. 3, 1972, 72.38945; Mar. 19, 1973, 73.09729; Aug. 31, 1973, 73.31516

Int. Cl.² H01M *4/88*

U.S. Cl. 264—28 **15 Claims**



1. A process for the preparation of electrodes for electrochemical generators, said electrodes comprising a collecting part consisting of an electrochemically conductive and chemically inert material partially coated with electrochemically active material comprising a metal or a compound of said metal and a partially reticulated polymer, said polymer being soluble in water, said process comprising preparing a substantially saturated solution of said polymer in water, to which is added an organic compound providing an aldehyde in a sufficient quantity to partially reticulate said polymer in the presence of at least one catalyst to the extent of 5–20%,

adding to the aqueous solution of said polymer a salt of said metal in a quantity of 20–50 parts by weight per part of polymer, said salt being soluble in water and compatible with the polymer and being added at a temperature of 50°–100°C,

pouring the solution into a mold in which said collecting part of the electrode has been previously arranged, until said part is completely immersed,

cooling the mold to a temperature at maximum equal to −20°C to form a cake, through which diffusion can occur, of said solution in which said collecting part is immersed, removing from the mold the cake which has been formed therein and immersing it in an alkaline solution saturated with an oxide of said metal,

washing said cake in cold water,

drying the cake at a temperature of 20°–60°C, and

compressing the cake at a pressure of between 2 and 10bars/cm².

3,917,770

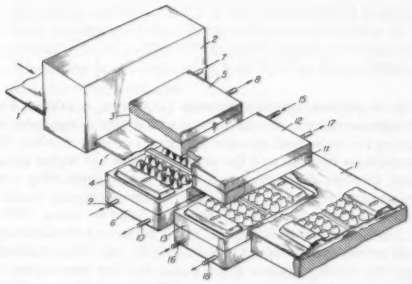
METHOD OF THERMOFORMING THERMOPLASTIC FOAM MATERIAL

William B. Jackson, Canandaigua, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 7, 1973, Ser. No. 413,748

Int. Cl. B29d *7/22, 7/24, 7/00*

U.S. Cl. 264—28 **8 Claims**



1. A method for shaping polystyrene foam which comprises: heating a sheet of polystyrene foam to a temperature sufficient for deep draw forming of said polystyrene foam,

deep draw forming at an elevated temperature said heated polystyrene foam to form a preform substantially the shape of a product article desired, and

reshaping the deep drawn polystyrene foam preform without rupture between reshaping molds maintained at a temperature below 50°F to form the article desired.

3,917,771

SEALANT FILLER FOR SMALL VOLUMES CONTAINING AN ACRYLIC LATEX, SAND, BENTONITE, PORTLAND CEMENT AND A POLYHYDRIC ALCOHOL

Mario J. Basile, 8512 Fifth Ave., Brooklyn, N.Y. 11209

Filed Jan. 9, 1974, Ser. No. 431,842

Int. Cl.² E04B *1/16*

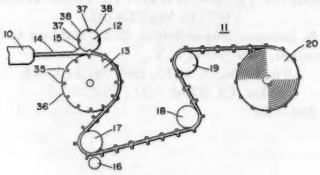
U.S. Cl. 264—35 **5 Claims**

1. The method of patching a recess comprising the steps of forming a first component including 0.14 to 0.42 parts water and 0.86 to 2.58 parts acrylic resin solids as a latex and 1 to 3 parts sand and a second component including a viscous suspension of 1 to 5 parts bentonite and 1 to 5 parts Portland cement in a polyhydric alcohol selected from the group consisting of glycerine, glycol and polyglycol, admixing a major part of said first component and a minor part of said second component and applying said admixture to said recess.

3,917,772
METHOD FOR PRODUCING BATTERY SEPARATOR SHEET

Bonderinko Hollenbeck, Pelham, N.H., assignor to W. R. Grace & Co., Cambridge, Mass.

Continuation-in-part of Ser. No. 225,205, Feb. 10, 1972, Pat. No. 3,798,294. This application Feb. 4, 1974, Ser. No. 439,517
The portion of the term of this patent subsequent to Mar. 19, 1991 has been disclaimed.
Int. Cl.² B29D 7/06, 27/00
U.S. Cl. 264—41 7 Claims

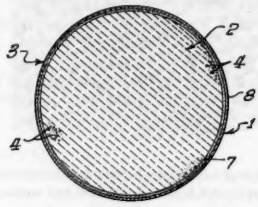


1. A process for continuously producing a porous sheet membrane suitable for conversion into a battery separator and having two principal opposite surfaces, one of which has short projections thereon and the other of which has higher projections thereon comprising extruding a self supporting easily deformable relatively plain sheet of thermoplastic material, said thermoplastic material being oil filled to above 30% by volume; calender molding said sheet between two calendering rolls having synchronized surface speeds, one of said calendering rolls having shallow depressions that are interrupted circumferentially and spaced around the circumference thereof and being hot and the other of said calendering rolls having deeper depressions that are interrupted circumferentially and spaced around the circumference thereof and being warm, said sheet surface having said short projections being formed against said calendering roll having said shallow depressions and said sheet surface having said higher projections being formed on said calendering roll having said deeper depressions; forming a bank of said oil filled material from said extruded sheet at the nip of said calendering rolls and maintaining said bank at said nip; transporting the calendered sheet around at least 20% of the circumference of said calendering roll having said deeper depressions and partially setting said calendered sheet including said projections; withdrawing said partially set higher projections from said deeper depressions, substantially straight out of said deeper depressions and at a rate of takeaway slightly greater than the speed at which said calendered sheet is transported by said calendering roll having said deeper depressions to prevent picking of said higher projection structure; before said sheet has entirely set engaging the side thereof having said short projections with a transporting roll and passing said sheet across a sizing roll that has the same surface speed as said transporting roll and trapping said sheet in a preset sizing gap between said sizing roll and said transporting roll with said sizing roll impinging against the top of said higher projections and pushing against the top of said higher projections and permanently deforming said higher projections and reducing their height and thereby setting the final thickness of said sheet; thereafter further cooling said sheet to complete its set and thereafter leaching at least enough of said oil from said sheet to make said sheet porous.

3,917,773
METHOD FOR FABRICATING A SHAPED DIELECTRIC ANTENNA LENS

Louis E. Gates, Jr., Westlake Village; William E. Lent, Los Angeles, and Jose A. Flores, Venice, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 428,589, Dec. 26, 1973, Pat. No. 3,866,234. This application Oct. 3, 1974, Ser. No. 511,905
Int. Cl.² H01Q 15/08
U.S. Cl. 264—44 16 Claims

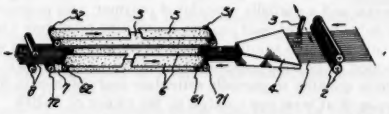


1. A process for fabricating a rigidly-shaped dielectric structure for transmitting high-frequency electromagnetic energy, said structure having a predetermined and uniform dielectric constant and said process comprising the consecutive steps of:
providing a quantity of porous ceramic granules having a substantially uniform pore size no larger than the minimum wavelength of said electromagnetic energy, said pore size as well as the composition of the granules being a determinable function of said predetermined dielectric constant,
intimately mixing said quantity of porous granules initially with a cohesive organic binder material capable of cohesively binding one granule to another and then with a flux material, said initial intimate mixing applying said binder material to the exterior surfaces of each of said granules for inhibiting penetration of said granule pores by said flux material,
controllably pressing said granular mixture to bindably form the mixture into said shaped structure the application of the pressure being controlled to provide a desired structural density,
controllably heating said shaped structure sufficiently to remove said organic binder material and,
sintering said shaped structure for providing said rigidity.

3,917,774
CONTINUOUS PROCESS FOR PREPARING A SHAPED ARTICLE OF A FOAMED RESIN REINFORCED BY FIBRES

Norio Sagane, Osaka; Toru Morimoto, Takatsuki, and Fumihiko Okagawa, Hirakata, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 17, 1973, Ser. No. 361,045
Claims priority, application Japan, May 17, 1972, 47-49279
Int. Cl.² B29C 3/00, 15/00; B29D 7/14
U.S. Cl. 264—46.2 13 Claims



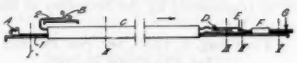
1. A continuous process for producing an elongated shaped article reinforced by a multiplicity of continuous fibres comprising

a. advancing a multiplicity of continuous parallel fibres and simultaneously
b. arranging said continuous parallel fibres in sheet-like form,
c. impregnating said sheet-like form of continuous fibres with a foamable resin which is in a liquid state and which is capable of hardening into a thermosetting resin,
d. gathering the resultant resin impregnated sheet-like form of continuous fibres to form a bundle of continuous parallel fibres having said foamable resin dispersed therein
e. advancing said bundle of fibres through a movable molding passage for a time sufficient to allow the desired foaming and hardening of said foamable resin, said movable molding passage having a cross-section corresponding to the desired cross-section of the elongated shaped article and being formed by walls that move with and contact the surfaces of said elongated shaped article, and
f. removing said elongated article from said molding passage.

3,917,775
METHOD FOR THE PRODUCTION OF WALL PANELS

Walter Nilsen, Prins Oscarsgt, 32, N-3000 Drammen, Norway

Filed Feb. 14, 1974, Ser. No. 442,520
Claims priority, application Norway, Feb. 15, 1973, 623/73
Int. Cl.² B29D *27/04*
U.S. Cl. 264—46.2 **5 Claims**



1. A method of producing panels which comprises forming a first continuous web of a composite structure by introducing a gypsum material between two opposed travelling paper webs; simultaneously forming a second continuous web of such a composite structure by the introduction of gypsum material between a further two opposed travelling webs; transporting said continuous structures without interruption and in opposed relationship from a region at which said webs are formed to a drying chamber and drying said structures to an extent to cause them to become substantially rigid; thereafter introducing a foamable plastic material and a blowing agent into a space defined by opposed faces of said substantially rigid structures during transportation of said structures; continuing transportation of said structures to a callibrating device and in so doing reducing the space between said opposed faces of the structures to a predetermined size to be filled by expansion of said plastic material and related to the required thickness of a panel; maintaining the structures in substantially parallel relationship, curing the resultant composite web of plaster-boards and foamed plastic material and cutting said composite web into panels of selected length.

3,917,776
PROCESS FOR PRODUCING CARBON FIBER

Hiroshi Sato; Hiroji Takahashi; Takeshi Kaneko, and Toro Takemura, all of Hiroshima, Japan, assignors to Mitsubishi Rayon Company, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 206,118, Dec. 8, 1971, abandoned. This application Sept. 27, 1973, Ser. No. 401,278
Claims priority, application Japan, Dec. 12, 1970, 45-110085; Dec. 28, 1970, 45-119712; June 14, 1971, 46-41650
Int. Cl.² D01C *5/00;* **D06C** *7/04*
U.S. Cl. 264—29 **5 Claims**

1. A process for producing a carbon fiber which comprises:
a. admixing with a copolymer containing at least 85 mole percent of acrylonitrile and 0.03 to 11 mole % of at least one cross-linkable vinyl monomer selected from the group consisting of acrylic acid, methacrylic acid, itaconic acid, itaconic acid amide, N-methylol acrylamide, ethylene glycol dimethacrylate, ethylene glycol diacrylate, divinyl benzene, glycidyl methacrylate, ethyl benzylazilidine acrylate and diacetone acrylamide; 0.0002 to 5.5 g atom, calculated as metal per mole of copolymer, of at least one pyrolysis catalyst selected from the group consisting of ethylene-diamine copper nitrate, copper acetylacetonate, chromium acetylacetonate, copper acetate, copper powder, metal complex of copper sulfate and succinamide, metal complex of zinc acetate and ethylene diamine, and metal complex of copper nitrate and ethyl l-glutamate;
b. spinning said copolymer into a fiber;
c. stretching said fiber to 1.2 to 8.0 times original length;
d. heat treating said fiber in an oxidizing atmosphere at a temperature of 210° to 320°C until a degree of molecular orientation is obtained of at least 85% by X-ray diffraction measurements; and
e. heat treating said fiber in non-oxidizing atmosphere at a temperature of 250° to 1200°C to effect carbonization.

3,917,777
PROCESS FOR THE PREPARATION OF DRY SEMIPERMEABLE

Tsunesaburo Asada, Minoh; Fumiaki Komatsu, Nishinomiya; Hideo Tsuge, Takarazuka; Chota Yanagi, Kobe, and Toshiyuki Kuwahara, Anagasaki, all of Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Filed Dec. 13, 1972, Ser. No. 314,599
Int. Cl.² B29D *27/04, 7/14*
U.S. Cl. 264—41 **7 Claims**

1. A process for the preparation of dry semipermeable membranes, which comprises:
casting a film from a casting solution consisting essentially of 9 to 13 percent by weight of a cellulose derivative having a viscosity of 20 to 100 seconds as measured by the ASTMD-1343-56 and D-871-63 methods, water or water-soluble alcohol wherein the weight ratio of the water or water soluble alcohol to said cellulose derivative being within a range of from 1:20 to 3:1, and a polar, substantially water soluble organic compound selected from the group consisting of acid amides, carbamides, acid imides, aldehydes, carboxylic acids, hydroxy acids and phosphoric acid esters with an organic solvent as the balance of the casting solution:
evaporating a portion of the organic solvent from said cast film;
dipping the partially evaporated film in water to extract the remainder of said organic solvent; and
drying the extracted film in air.

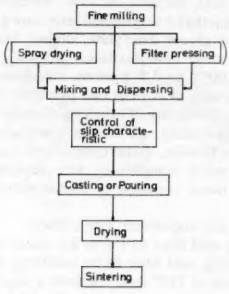
3,917,778
METHOD FOR SLIP CASTING SOFT FERROMAGNETIC FERRITES

Yoichi Shiraki; Shoichi Wakabayashi, both of Tokyo; Mitsunobu Yokoyama, Funabashi; Isao Yokoyama; Shigeji Sugahara, both of Nikaho, and Satoshi Ogasawara, Akita, all of Japan, assignors to TDK Electronics Company, Tokyo, Japan

Continuation-in-part of Ser. No. 812,762, April 2, 1969, abandoned. This application Feb. 29, 1972, Ser. No. 230,226

Int. Cl. C04b *35/26, 35/28, 35/36*

U.S. Cl. 264—63 **2 Claims**



1. A method for slip casting soft ferrite material, comprising the steps of: (1) forming a suspension by suspending in an aqueous solution a soft ferrite powder in an amount of 65–80 percent by weight, the ferrite powder having the formula of $MeO:Fe_2O_3$, the molecular ratio of MeO to Fe_2O_3 being about 1:1, MeO being a oxide selected from the group consisting of MnO, MgO, NiO, ZnO and CuO and having a particle size distribution as follows:

particle distribution	wt. %
less than 2 microns	6.9 – 70.0
2 – 5 microns	90.0 – 20.0
5 – 20 microns	less than 10.0

the aqueous solution including an organic dispersing agent having properties of deflocculant, binder and lubricant in an amount greater than 0.05 percent by weight of the ferrite powder; (2) introducing the suspension into a water-absorbing mold to form a wet casting; (3) dehydrating the casting; (4) sintering the casting.

3,917,779
INTRODUCTION OF REACTANTS INTO MOULDS AND ARTICLE PRODUCED

Karl Breer, Cologne, and Klaus Schulte, Leverkusen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 155,086, June 21, 1971, Pat. No. 3,794,451. This application Sept. 17, 1973, Ser. No. 398,913

Claims priority, application Germany, June 26, 1970, 2031747

Int. Cl.² B29D *27/04*

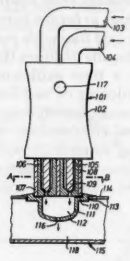
U.S. Cl. 264—46.5 **9 Claims**

1. Process of moulding article in a shell wherein reactants are combined, react, and form a polymeric material composing the article filling the shell to effect said moulding, which comprises:

a. the step of providing in a wall of the shell, a container to serve as a mixing chamber and as an insert in a wall of the shell for receiving the reactants, and mixing them and discharging the mixed reactants to within the shell,

b. said mixing chamber have at least one outlet opening for discharge of reactants mixed therein, into the shell,

c. introducing the reactants into the mixing chamber for mixing thereof in the mixing chamber and discharge



thereof through said outlet opening (s) and into the shell,

d. allowing the reactants to react in the shell for formation of the article and integration of the mixing chamber with the article.

2. Process according to claim 1, wherein the reactants form a polymeric foam.

3,917,780
PREPARATION OF LEAD LANTHANUM ZIRCONATE TITANATE BODIES

Khodabakhsh S. Mazdiyasni, Xenia, and Leanne M. Brown, Brookville, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 9, 1973, Ser. No. 386,925

Int. Cl.² C04B *35/26*

U.S. Cl. 264—61 **4 Claims**

1. A method for preparing a ceramic body which comprises calcining an alkoxy-derived lead lanthanum zirconate titanate powder rich in lead oxide and having a particle size of 75 to 300A and a purity of at least 99.95 percent by heating the powder at a temperature in the range of 300° to 500°C for a period of 30 minutes to 1 hour; uniaxially cold pressing the calcined powder at 1,000 to 5,000 psi for a period of about 5 to 10 minutes; isostatically cold pressing the resulting compacted powder at 10,000 to 30,000 psi for a period of about 5 to 10 minutes; and sintering the resulting compacted body by heating same, while covered with the powder, in an oxygen atmosphere at a temperature between 1050°–1175°C for a period of 4 to 8 hours.

3,917,781
ALTERING THE PROPERTIES OF CONCRETE BY ALTERING THE QUALITY OR GEOMETRY OF THE INTERGRANULAR CONTACT OF FILLER MATERIALS

Lester H. Gabriel, 4841 Tono Way, Sacramento, Calif. 95841, and Wilfred Ernest Willis, 3633 Jackson St., San Francisco, Calif. 94118

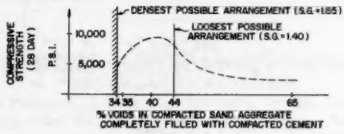
Continuation-in-part of Ser. No. 886,556, Dec. 19, 1969, which is a continuation-in-part of Ser. No. 792,370, Jan. 21, 1969, abandoned. This application June 21, 1972, Ser. No. 264,785

Int. Cl.² B28B *1/08*

U.S. Cl. 264—71 **8 Claims**

1. In a method for preparing concrete wherein graded dry aggregate is dry mixed with dry cement composition in a preparation such that (1) the individual particles of the cement composition are uniformly smaller than the individual particles of the aggregate and are smaller than the individual void spaces between the adjacent aggregate particles of the

cement-free dry compacted aggregate, and (2) the bulk volume of dry compacted cement composition in the finished concrete is approximately equal to the bulk volume of total void space in the dry compacted cement-free aggregate, the mold then filled with the resultant dry mixture, and the dry mixture compacted in the mold to reduce substantially the


DENSEST POSSIBLE ARRANGEMENT (S.G.=1.85)
LOOSEST POSSIBLE ARRANGEMENT (S.G.=1.40)
COMPRESSIVE STRENGTH (28 DAY) P.S.I.
10,000
5,000
34 35 40 44 65
% VOIDS IN COMPACTED SAND AGGREGATE COMPLETELY FILLED WITH COMPACTED CEMENT

volume of void space and to force the aggregate particles into direct contact with each other and the cement composition particles into the spaces between the aggregate particles, preparatory to adding water and later curing, the improvement in which the compacting step comprises vibrating said dry mixture in a vertical direction at a low-frequency rate less than 120 cycles pre minute.

3,917,782

METHOD FOR PREPARING THIN-WALLED CERAMIC ARTICLES OF CONFIGURATION

Cressie E. Holcombe, and George L. Powell, both of Oak Ridge, Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed May 16, 1973, Ser. No. 361,000

Int. Cl.[2] B29C *5/02, 13/04*

U.S. Cl. 264—81 **6 Claims**

1. A method of manufacturing a freestanding, hollow ceramic article of a concave configuration with a wall thickness in the range of 0.005 to 0.20 inch and a density of at least 90 percent theoretical, comprising the steps of plasma flame spraying powdered ceramic material onto a concave surface within a reusable metal substrate to form a coating of the ceramic material on said surface, said metal substrate having a coefficient of thermal expansion substantially less than that of said ceramic material, heating the coated substrate to a temperature adequate to anneal and sinter the ceramic coating with said heating simultaneously effecting the expansion of the ceramic coating against the substrate for holding the coating in compression, reducing the temperature of the coated substrate to shrink the ceramic coating relative to the substrate to effect separation of the ceramic coating from the substrate, and thereafter removing the resulting ceramic article from the substrate.

3,917,783

METHOD FOR STRENGTHENING BORON FILAMENTS FOR USE IN FORMING FILAMENTARY COMPOSITES

Dwight Ray Waterman, San Pedro; Gary G. Brown, Diamond Bar, and George J. Mills, Santa Ana, all of Calif., assignors to Northrop Corporation, Los Angeles, Calif.

Filed Aug. 22, 1973, Ser. No. 390,596

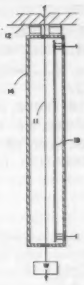
Int. Cl.[2] B29C *3/00, 25/00*

U.S. Cl. 264—85 **3 Claims**

1. A method for treating a boron filament to improve the tensile strength thereof comprising the steps of:

placing at least a portion of such filament under tension in a substantially linear configuration, and

maintaining the filament at a temperature of 200°–350°F for a period of time sufficient to increase the tensile strength of said filament, said filament being maintained in a chamber filled with substantially pure nitrogen during



said period to heal defects on the surface thereof but not so as to nitride said surface.

3,917,784

METHOD FOR PRODUCING PILE FABRICS HAVING EXCELLENT APPEARANCE AND PROPERTIES

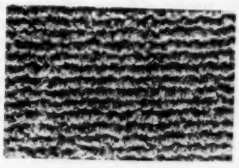
Takeshi Nishida, Kobe, Japan, assignor to Kanebo, Ltd., Tokyo, Japan

Filed Aug. 13, 1973, Ser. No. 387,945

Claims priority, application Japan, Aug. 15, 1972, 47-81740; Aug. 15, 1972, 47-81741

Int. Cl.[2] D02G *1/20;* **B29H** *7/18*

U.S. Cl. 264—103 **21 Claims**



1. A method of producing a pile fabric, which comprises the steps of:

1. conjugate spinning a fiber-forming polyamide and a fiber-forming polyester in side-by-side relation at a conjugation ratio of from 1/3 to 3/1 to form bicomponent filaments;
2. applying to the bicompoment filaments of step 1 after they exit from the spinneret, first
   a. from 0.5 to 2.0 wt. % of a spinning oil composition containing less than 10 wt. % of water, and then
   b. from 0.3 to 1.5 wt. % of a spinning oil composition containing more than 40 wt. % of water;

the foregoing steps 2(a) and 2(b) being carried out without drawing the filaments;

3. drawing the bicomponent filaments of step (2) at a temperature of from 70° to 130°C, and then taking up the bicomponent filaments on a bobbin, the filaments at this time being substantially unsplit and uncrimped and possessing the inherent properties of a spontaneous crimp percentage of more than 40%, a split percentage of more than 70% and a shrinkage difference of from 2 to 12%;
4. unwinding the filaments from the bobbin, and permitting the filaments to relax in air to develop spontaneous crimps in the filaments;
5. placing the crimped filaments in a vessel at a filling density of from 150 to 380 grams of filament per liter of vessel volume, and therein immersing the crimped filaments in water having a temperature of less than 50°C and then raising the temperature of the water to more

than 80°C to set the crimps and simultaneously to split the components of the filaments; and

6. forming the split filaments of step (5) into a pile fabric.

3,917,785

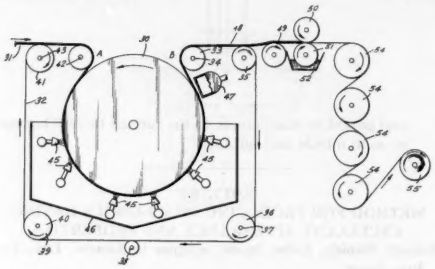
METHOD FOR PRODUCING NONWOVEN FABRIC

Frank Kalwaites, Gladstone, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Division of Ser. No. 295,768, Oct. 6, 1972, abandoned, which is a continuation-in-part of Ser. No. 110,193, Jan. 27, 1971, abandoned. This application Sept. 13, 1973, Ser. No. 397,032

Int. Cl.² D04H *1/50, 1/70, 3/08*

U.S. Cl. 264—108 **8 Claims**



1. A method of treating a layer of fibers to form a web of fibers having areas of varying opacity and varying fiber concentration comprising: supporting a layer of fibers on an impermeable patterned support member, applying a plurality of fiber moving forces to one side of said supported layer, a substantial number of forces acting in the plane of the layer and a substantial number of forces acting at various angles to the plane of the layer, said angle forces being applied and dissipated from the same side of the layer whereby a pattern of areas of varying fiber concentration and varying opacity is produced in the layer, said areas of varying fiber concentration and varying opacity having substantially the same fiber density throughout the fibrous web, said pattern conforming to the pattern of said support member.

3,917,786

METHOD OF AND SYSTEM FOR MAKING SYNTHETIC FOSSILS

Franz Weigert, Adalbert-Stifter-strasse 13, D-8858 Neuburg, Donau, Germany

Division of Ser. No. 116,197, Feb. 17, 1971, Pat. No. 3,769,114. This application Jan. 8, 1973, Ser. No. 321,734

Claims priority, application Germany, Feb. 19, 1970, 2607643

The portion of the term of this patent subsequent to Oct. 30, 1990, has been disclaimed.

Int. Cl.² B29C *1/02*

U.S. Cl. 264—129 **4 Claims**

1. A method of making a synthetic fossil comprising the steps of:

photographing a natural fossil having a contoured surface to form a color-faithful image of said natural fossil;

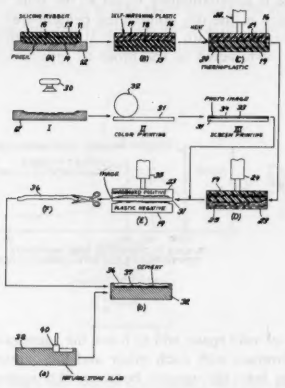
imprinting a surface of a flat sheet with said color-faithful photographically reproduced image of said natural fossil;

casting a master negative of said natural fossil;

casting a positive of said master negative;

forming a male die member and a female die member with the contours of said master negative and said positive and with complementary contours corresponding to those of the surface of said natural fossil;

pressing said sheet between said die members with the contours in registry with the color-faithful image applied to said sheet to conform said sheet to the contoured surface of said natural fossil and produce a three-dimensional reproduction of said natural fossil from said sheet; and



cutting out said three-dimensional reproduction from said sheet along the outline of said contour and said image.

3,917,787

METHOD OF MAKING A SLIDE-FASTENER COUPLING ELEMENT

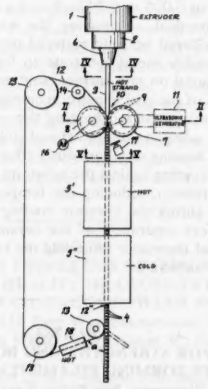
Harry Hansen, Copenhagen-Valby, Denmark, assignor to Opti-Holding AG, Glarus, Switzerland

Filed Nov. 16, 1973, Ser. No. 416,451

Claims priority, application Germany, Nov. 16, 1972, 2256095

Int. Cl.² B28B *11/16*

U.S. Cl. 264—146 **4 Claims**



1. A method of making a slide-fastener coupling element comprising the steps of:

continuously extruding a synthetic-resin strand of uniform and homogeneous cross-section at a plastic-deformation temperature above the plastic-flow temperature of the resin and below the melting point thereof;

pressing said strand while it is still at a plastic-deformation temperature at a pressing station into a shape having coupling heads prior to cooling of said strand below said plastic-flow temperature;

continuously embedding an inextensible continuous element of a material other than that of said strand and in the form of a section of a loop of flexible element into said synthetic-resin strand at said pressing station concurrently with the pressing thereof into said shape;

thereafter continuously passing the strand united with said element through a treatment station downstream of said pressing station to harden said strand; and

thereafter continuously separating said inextensible element from said synthetic-resin strand.

3,917,788

METHOD FOR MANUFACTURING A CONTAINER HAVING A THICKENED LIP

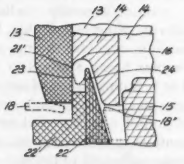
Pietro Padovani, 2, Lungadige Matteotti, Verona, Italy

Division of Ser. No. 223,945, Feb. 7, 1972, Pat. No. 3,825,166. This application Feb. 5, 1974, Ser. No. 439,835

Claims priority, application Italy, Feb. 13, 1971, 84912/71

Int. Cl.[2] B29C *17/04, 17/10*

U.S. Cl. 264—153 **5 Claims**



1. A method for providing an encircling lip at the edge of a container which has an open top end and an opposed bottom end during molding of the container from a thermoplastic sheet material while the sheet material is at an elevated temperature and in a flowable condition, the steps of squeezing the sheet material at the region adjacent said open top end while restricting outward flow of the squeezed sheet material as well as flow thereof away from said bottom end to form a thickened lip portion encircling the open top end of the container and having an outer peripheral edge, engaging the thickened lip portion at its outer peripheral edge and stretching the thickened lip portion while it is still in a plastic, flowable condition toward the bottom end of the container to provide the container at its lip portion with a stretched flange surrounding the previously squeezed region of the thermoplastic sheet material and having an inner surface spaced from and directed toward said previously squeezed region and an outer surface directed away therefrom, and while the lip portion is in its stretched condition severing the thermoplastic sheet material from the thus-stretched lip portion at said peripheral edge thereof so that the stretched portion snaps back upon itself for increasing the thickness of said flange while shortening the length thereof.

3,917,789

METHOD FOR MOLDING A PLASTIC CONTAINER HAVING A MOLDED HANDLE PIVOTALLY RETAINED BY AN INTEGRALLY FORMED ATTACHMENT

Raymond A. Heisler, 657 Dakota Trail, Franklin Lakes, N.J. 07417

Division of Ser. No. 333,500, Feb. 20, 1973, Pat. No. 3,861,840. This application Oct. 31, 1974, Ser. No. 519,688

Int. Cl.[2] B29F *1/00*

U.S. Cl. 264—219 **14 Claims**

1. The method of molding a container and a rotably secured bail handle whose ends are molded around mating portions formed on the exterior surface of said container to provide a rotatably secured attachment of the handle to the container, the steps of molding including:

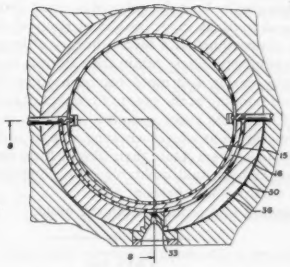
a. forming a mold having complementary male and female components which when closed provides a cavity for the molding therein of a container;

b. forming a pair of shaped recesses in the female portion of the mold and positioning said recesses so that when the container is molded these recesses form a pair of diametrically opposed portions intergrally attached to the outer portion of the container;

c. forming a pair of opposed guideways in the female mold portion and slidably carrying in each of said guideways a movable pin with each pin having an inner end formed to provide a fixed member portion of a molded-in place rotatable connection of the container;

d. said female component of the mold having a bail handle forming cavity and a sprue connecting said bail handle forming cavity to a source of molten plastic;

e. sequently moving each of the pins to at least three selected positions and maintaining each of these positions during a molding step and until said molding step is completed, the first position requiring the moving of each of the pins until the inner end of each pin is positioned within one of said recesses and at this position retaining



the pins as and until plastic is flowed in the closed mold to form the molded container;

f. after molding the container moving of the pins to the second position being sufficient to uncover the fixed member portions of the container and form mold recesses for the hubs of a bail and also to uncover a passageway from the bail forming cavity to and into each of the bail hub mold recesses, the ends of the positioned pins providing outer walls closing the handle hub cavities;

g. injecting a determined amount of molten plastic into the handle cavity and from this cavity into the passageways at the ends of the bail handle forming cavity and into mating portions for the rotatable attachment of the handle provided on the plastic container to form rotatably secured hubs of the bail handle the molded container is still in the mold;

h. moving each of the pins further to a third position, which position is sufficient to release the inner ends of the movable pins from engagement with the just formed hubs while the attached bail handle is still in the mold, and

i. opening the mold and removing the container and attached bail handle from the mold, the materials of said container and said handle being incompatible.

3,917,790

PROCESS FOR MOLDING WITH PRE-FABRICATED GEL COATS

Stanley Oswitch, University Heights, and Kevin K. Kipp, Solon, both of Ohio, assignors to Ferro Corporation, Cleveland, Ohio

Division of Ser. No. 321,584, Jan. 8, 1973, Pat. No. 3,812,074, which is a continuation-in-part of Ser. No. 199,752, Nov. 17, 1971, Pat. No. 3,770,690, which is a continuation of Ser. No. 43,213, June 3, 1970, abandoned. This application Feb. 20, 1974, Ser. No. 444,039

Int. Cl.[2] B29D *3/00*

U.S. Cl. 264—267 **5 Claims**

1. A process for molding a gel coat onto a product formed from a curable, moldable resin composition in a mold therefor, comprising:

a. fitting along a surface of said mold a dry, flexible prefabricated gel coat comprising a sheet of substantial uniform thickness of a partially cured, curable, thermosetting polyester resin and a fibrous reinforcing medium of thermoplastic resin compatible with the polyester resin;

b. introducing into said mold and against a surface of said sheet remote from the mold a moldable resin composition selected from the group consisting of epoxy resins and polyester resins;

c. heating the dry gel coat to soften both the thermoplastic fibers and the partially cured polyester resin of the gel coat, flowing and shaping the softened thermoplastic fibers and partially cured polyester resin to a desired shape determined by the mold;

d. continuing to heat the gel coat to bring about a final cure of said partially cured polyester resin while maintaining the temperature at a level whereby at least some of the thermoplastic fibers retain their fibrous form;

e. finally curing said moldable resin composition to bring about bonding at the point of contact of said gel coat and said moldable resin composition while maintaining the temperature at a level whereby at least some of the thermoplastic fibers retain their fibrous form and to form said product from said moldable resin composition having a gel coat molded thereon; and

f. removing said product from the mold.

3,917,791

METHOD FOR THE BELLOWLESS VULCANIZATION OF TIRE BLANKS

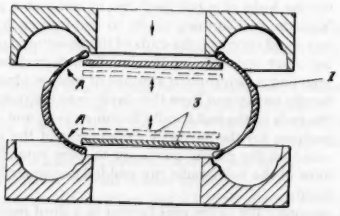
Egon Kratochvil, Maria Enzersdorf, and Günther Pech, Vienna, both of Austria, assignors to Semperit AG, Vienna, Austria

Filed Feb. 5, 1973, Ser. No. 329,848

Claims priority, application Austria, Feb. 8, 1972, 993/72; Feb. 8, 1972, 994/72

Int. Cl.[2] B29H *5/02*

U.S. Cl. 264—326 **6 Claims**



1. In a method of bellowless vulcanization of tire blanks having tire beads comprising the steps of:

a. providing a tire mold including a pair of heated mold halves,

b. inserting a tire blank in the mold and sealing the beads therein by means of a press mechanism,

c. dishing the tire blank by bringing the heated mold halves together,

d. rotating the tire beads during said dishing step, and

e. performing a vulcanization operation;

the improvement comprising releasing the press mechanism at least for a period of time prior to initiation of said vulcanization operation to permit rotation of the tire beads during dishing of the tire blank.

3,917,792

ELASTOMERIC POLYURETHANE PARTS PRODUCED BY LIQUID INJECTION MOLDING

Philip Conacher, Jr., Wilmington, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Continuation-in-part of Ser. No. 365,979, June 1, 1973, abandoned. This application Jan. 28, 1974, Ser. No. 436,950

Int. Cl.[2] B29F *1/06*

U.S. Cl. 264—328 **8 Claims**

1. In a process wherein an NCO— terminated polyurethane prepolymer is cured by contact with a complex of 4,4′-methylene dianiline and a salt selected from the group consisting of sodium chloride, sodium bromide, sodium iodide, sodium nitrite, lithium chloride, lithium bromide, lithium iodide, lithium nitrite, and sodium cyanide; the ratio of the dianiline to the salt in the complex being 3 moles to 1 mole, said curing being conducted at a temperature of approximately 100° to 195°C., the improvement comprising injecting a flowable dispersion of said prepolymer into a closed, preheated mold, said dispersion containing entrapped air, applying a pressure to the mold contents sufficient to prevent the entrained gases from escaping from the mold, and recovering a bubble-free polyurethane casting.

3,917,793

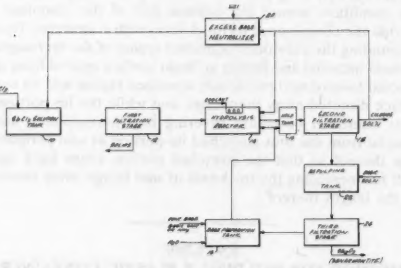
PROCESS FOR THE PRODUCTION OF SENARMONTITE BY CONTROLLED HYDROLYSIS OF ANTIMONY TRICHLORIDE

John L. Shafer, Pomona, Calif., assignor to Occidental Petroleum Corporation, Los Angeles, Calif.

Filed Mar. 2, 1973, Ser. No. 337,542

Int. Cl.[2] C01B *27/00, 29/00*; **C01G** *29/00*

U.S. Cl. 423—617 **29 Claims**



1. A process for the production of senarmontite which comprises:

a. reacting antimony trichloride with a base consisting of alkali, alkaline earth metal and ammonium bases and mixtures thereof and water to hydrolyze the antimony trichloride to particulate cubic antimonous oxide in an aqueous chloride solution containing a chloride selected from the group consisting of alkali metal chlorides, alkaline earth metal chlorides, ammonium chloride and mixtures thereof, said aqueous chloride solution being maintained at a temperature from the freezing point of said

solution to about 40°C and at a pH of from about 7 to about 10;

b. recovering the particulate cubic antimonous oxide from the aqueous chloride solution.

3,917,794

METHOD OF PATTERN FORMATION

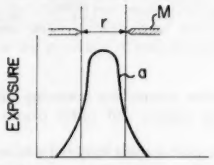
Motoo Akagi; Yoichi Oba; Takahiro Kohashi, all of Hachioji; Hazime Morishita, Tokyo; Toyoaki Kimura, Nagoya; Saburo Nonogaki; Mitsuru Oikawa, both of Tokyo; Yoshiro Otomo, Mitaka, and Yoshifumi Tomita, Mobara, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 26, 1973, Ser. No. 327,159

Claims priority, application Japan, Jan. 26, 1972, 47-9094

Int. Cl.² B05D *5/12*; **H01J** *1/54, 9/22*

U.S. Cl. 427—68 **22 Claims**



1. A method for forming a pattern of areas of photoresist material on a surface free of interconnections between said areas comprising the steps of:

applying a reciprocity-law failing photoresist material containing a water-soluble polymer consisting of at least one of polyvinylpyrrolidone and copolymers of vinylpyrrolidone, and a water-soluble bisazide compound onto a surface on which a desired pattern is to be formed,

desiccating the applied photoresist material to form a photoresist layer,

placing a mask having a desired pattern of beam apertures in spaced relation to said photoresist layer,

in an atmosphere containing oxygen gas irradiating by light areas of said photoresist layer through the beam apertures of said mask to form a pattern of irradiated areas on said resist layer corresponding to said desired pattern, said irradiation by light of said photoresist layer being performed under a condition that the Schwarzschild's constant p of said photoresist material is in the range: $0<p<0.76$, and

developing said photoresist layer after the irradiation by light so as to form a pattern of hardened areas of said photoresist layer on said surface corresponding to the desired pattern of beam apertures, each of the hardened areas having a slightly smaller area than that of the areas of said layer actually irradiated by said light.

3,917,795

METHOD OF TREATING COAL REFUSE

Eugene A. Pelczarski; James A. Karnavas, and Paul J. La Rosa, all of Pittsburgh, Pa., assignors to Black Sivalls & Bryson, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 93,723, Nov. 30, 1970, abandoned. This application Dec. 13, 1972, Ser. No. 314,615

Int. Cl.² C01F *11/18*; **C22B** *1/11*; **C01B** *17/06*

U.S. Cl. 423—168 **8 Claims**

1. A method of treating relatively low heating value coal refuse containing a high ash content and sulfur in the form of pyrites comprising the steps of:

mixing the coal refuse with limestone in an amount of at least about 3 pounds of limestone per pound of sulfur contained in said coal refuse;

agglomerating the coal refuse-limestone mixture into pellets;

heating the coal refuse-limestone pellets to a temperature in the range of from about 1,600°F to about 2,800°F without melting said pellets so that pyrites contained in the coal refuse react with lime to form metallic oxide compounds and calcium sulfide thereby converting the pellets to mixtures of calcium sulfide, metallic oxide compounds and ash; and

reacting the calcium sulfide-metallic oxide-ash pellets with carbon dioxide and water to form a coherent calcium carbonate bonded pellet product and hydrogen sulfide.

3,917,796

METHOD OF INCINERATING VENT GAS

Harold O. Ebeling, Houston, Tex., assignor to Black, Sivalls & Bryson, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 272,785, July 18, 1972, abandoned. This application Feb. 4, 1974, Ser. No. 439,261

Int. Cl.² F23J *3/00*; **F23N** *1/02*

U.S. Cl. 423—210 **4 Claims**

1. A method of incinerating a stream of natural gas comprising the steps of:

conducting said stream of natural gas to a combustion chamber;

conducting a stream of combustion air to said combustion chamber;

intimately mixing said stream of natural gas with said stream of combustion air within said combustion chamber;

varying the quantity of combustion air conducted to said combustion chamber in direct predetermined proportion to variations in the quantity of natural gas conducted thereto so that when said stream of combustion air is mixed with said stream of natural gas a substantially stoichiometric mixture results;

combusting the resultant combustion air- natural gas mixture within said combustion chamber so that the mixture is converted to a stream of inert products of combustion; conducting the stream of inert combustion products to a mixing chamber;

conducting a stream of quenching medium to said mixing chamber;

intimately mixing said stream of combustion products with said stream of quenching medium;

varying the quantity of quenching medium conducted to said mixing chamber in direct proportion to variations in the temperature of said mixture of combustion products and quenching medium so that said mixture attains a desired temperature; and

releasing said combustion products-quenching medium mixture to the atmosphere.

3,917,797

REMOVAL OF CONTAMINANTS FROM GASEOUS STREAMS

Richard S. Reed, Millington, and Alan R. Glueck, Lawrenceville, both of N.J., assignors to Catalox Corporation, Millington, N.J.

Filed May 8, 1974, Ser. No. 467,938

Int. Cl.² B01D *53/34*

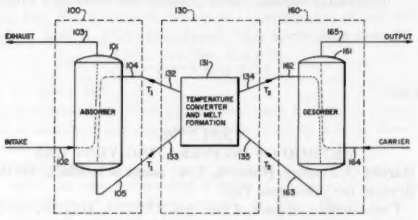
U.S. Cl. 423—210.5 **12 Claims**

1. The method of removing sulfur dioxide from a mixture of gases comprising the steps of:

a. Passing the mixture of gases through an absorber;

b. Contacting the mixture of gases with a molten salt complex of vanadium oxide and alkali metal compound in said absorber at a temperature in the range from about 500° to about 700°F.;

c. Removing the molten salt from said absorber and elevating the temperature of the salt by about 100°F.;



d. Separating sulfur trioxide from the molten salt with a gaseous stream.

3,917,798

SO_2 ABATEMENT

Alvin E. Konopik, Newark, Del., and James D. Kusko, Highland, Ind., assignors to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed Sept. 24, 1973, Ser. No. 400,041
Int. Cl.² C01B *17/00*
U.S. Cl. 423—242 **3 Claims**

1. In the process for removing SO_2 from a gas stream by (a) contacting the stream with an aqueous scrubbing liquid containing 30 to 80% by weight sulfuric acid and a minor amount of peroxygen compound, (b) withdrawing a portion of the scrubbing liquid and (c) concentrating it in admixture with the circulating acid stream of a sulfuric acid plant, the improvement comprising removing residual peroxygen compound from the withdrawn scrubbing liquid prior to admixing it with the circulating acid stream by adding with agitation to the withdrawn scrubbing liquid sufficient 93 to 99% by weight sulfuric acid to obtain an admixture having a concentration of 60–90% by weight sulfuric acid and, by heat of dilution, a temperature of 100°–150°C.

3,917,799

SULFUR OXIDE ADSORPTION AND RECOVERY

Samuel L. Torrence, Charleston, S.C., and William C. Walker, New York, N.Y., assignors to Westvaco Corporation, New York, N.Y.

No Drawing. Continuation of Ser. No. 752,253, Aug. 13, 1968, abandoned. This application Feb. 26, 1973, Ser. No. 335,687
Int. Cl. C01b *17/02, 17/00*
U.S. Cl. 423—244 **11 Claims**

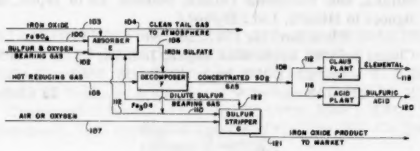
1. A process for regenerating a hard granular activated carbon adsorbent having sulfuric acid adsorbed thereon comprising; contacting the activated carbon having sulfuric acid adsorbed thereon with an oxide-reducing gas selected from the group consisting of hydrogen sulfide and carbonyl sulfide at a temperature between ambient and about 570°F. and sufficient to reduce the adsorbed sulfuric acid to at least one substance from the group consisting of elemental sulfur and sulfur dioxide without substantial burn-off of activated carbon, and removing the thus-reduced substance from said activated carbon.

3,917,800

METHOD FOR REMOVING OXIDES OF SULFUR FROM SULFUR BEARING GAS

Patrick John McGauley, Port Washington, N.Y., and Abraham A. Dor, Lakewood, Ohio, assignors to The Hanna Mining Company, Cleveland, Ohio

Filed Oct. 5, 1973, Ser. No. 403,951
Int. Cl.² C01B *17/60*
U.S. Cl. 423—244 **11 Claims**



1. A continuous process for removing sulfur oxides from gases containing oxygen and sulfur oxides comprising the steps of:

a. providing a solid sorbent material selected from the class consisting of ferrous sulfate, iron oxide and mixtures thereof,

b. advancing at least a portion of said absorbing solids to an absorption zone,

c. contacting the sulfur oxide-containing gas in the absorption zone with the sorbent at a temperature between 250° and 550°C.,

d. reacting the sulfur oxides in the gas with the solid sorbent to form ferric sulfate and to produce a gas reduced in sulfur oxide content that can be discharged to the atmosphere,

e. discharging the gas reduced in sulfur oxide content to the atmosphere,

f. withdrawing a portion of the ferric sulfate-bearing solids after contact with the sulfur oxide-bearing gas,

g. contacting said ferric sulfate-bearing solids in the said withdrawn solids with a hot reducing gas at a temperature of from about 300° to about 700°C. to produce magnetite in the decomposition product and a product gas that contains sulfur dioxide,

h. recovering the sulfur dioxide-bearing gas and the magnetite-bearing product, and

i. recycling at least a portion of the magnetite-bearing product as the solid iron oxide sorbent in step (a).

3,917,801

FLOTATION OF BORIC ACID FROM SODIUM SULFATE OBTAINED DURING THE PROCESSING OF BORATE ORES

Martin Wilson, Anaheim, Calif., assignor to United States Borax & Chemical Corporation, Los Angeles, Calif.

Filed Jan. 3, 1974, Ser. No. 430,594
Int. Cl.² C01B *35/10*
U.S. Cl. 423—283 **21 Claims**

1. A method for isolating clean crystalline boric acid from a slurry, obtained by reaction between a borate ore and sulfuric acid and seriously contaminated with clay slimes and sodium sulfate, which comprises the steps of adding a crystal modifier to the slurry, stirring said slurry to which the crystal modifier has been added at a temperature from about 55°C. to about 100°C., cooling said slurry to a temperature near Glauber's salt transition temperature, adding a froth modifier to said slurry cooled to a temperature near Glauber's salt transition temperature, subjecting said cooled slurry to a froth flotation manipulation, and separating the tailings of the froth flotation manipulation from floated materials consisting essentially of clean crystalline boric acid.

3,917,802

MOLECULAR WEIGHT CONTROL IN $(NPCl_2)_n$ POLYMERIZATION

Harry Rex Allcock, and James Earl Gardner, both of State College, Pa., assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Apr. 11, 1973, Ser. No. 350,219

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] C01B *25/10, 21/52*

U.S. Cl. 423—300 **3 Claims**

1. In the polymerization of chlorocyclophosphazenes to produce a linear polymer $(NPCl_2)_n$ product in which n is from about 16 to about 20,000, wherein the polymerization of cyclo trimer, tetramer or mixtures thereof is conducted at temperatures of between 200° and 300°C, the improvement which comprises: maintaining an amount of PCl_5 between 0.25 moles and 1×10^{-5} moles of PCl_5 per mole of chlorophosphazene, present with said chlorophosphazene and conducting the polymerization in the presence of said amount of PCl_5.

3,917,803

PROCESS FOR THE PREPARATION OF PHOSPHORUS OXYBROMIDE

Egon Joerchel, Bad Soden, Taunus, and Rudolf Kohlhaas, Frankfurt am Main, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed June 19, 1973, Ser. No. 371,538

Claims priority, application Germany, June 21, 1972, 2230109; Feb. 19, 1973, 2308069

Int. Cl.[2] C01B *25/10*

U.S. Cl. 423—300 **8 Claims**

1. A process for the preparation of phosphorus oxybromide from phosphorus tribromide and oxygen in the presence of nitrogen oxides as a catalyst, which comprises reacting phosphorus tribromide at a pressure from about 0.5 to 10 atmospheres with oxygen in a halogenated hydrocarbon solvent capable of dissolving phosphorus oxybromide and nitrogen oxides and being miscible with phosphorus tribromide and having a boiling point from 30°C to 150°C at temperatures of from 0° to 120°C said solvent being at least one halogenated hydrocarbon and during the reaction being present at least 20 percent and up to 90 percent by volume of a reaction mixture, and separating the obtained phosphorus oxybromide obtained from said reaction mixture, whereby solidification of said phosphorus oxybromide and clogging of apparatus is avoided.

3,917,804

BASIC ZINC PHOSPHITES

Edward Louis White, Freehold; William Ernest Robertson, Trenton, and William Heng-Sen Yu, Hightstown, all of N.J., assignors to N L Industries, Inc., New York, N.Y.

Filed Aug. 6, 1973, Ser. No. 385,850

Int. Cl.[2] C01B *15/16, 25/26;* **C04B** *31/02;* **C09K** *3/20*

U.S. Cl. 423—305 **18 Claims**

1. A composition of matter essentially consisting of a basic zinc phosphite represented by the formula; X $ZnO.ZnHPO_3$ wherein X is a number from ½ to 10.

15. A process for preparing basic zinc phosphites comprising; (a) forming a zinc oxide and water slurry; (b) adding phosphorous acid to said slurry; the ratio of the number of moles of phosphorous acid to the number of moles of zinc oxide being from 1:1.5 to 1:11 and forming a basic zinc phosphite.

18. A tannin stain inhibitor represented by the formula; X $ZnO.ZnHPO_3.nH_2O$ wherein X is a number from ½ to 10 and n is a number from 0 to 3.

3,917,805

PRODUCTION OF PHOSPHORIC ACID OF HIGH PURITY

Masaki Takahara, No. 2-34, Fukaya-cho, Nishinomiya, Hyogo, Japan

Filed Apr. 5, 1974, Ser. No. 458,369

Claims priority, application Japan, Oct. 12, 1973, 48-115084

Int. Cl.[2] C01B *25/16*

U.S. Cl. 423—321 **5 Claims**

5. The process according to claim 1, wherein the washing is carried out until the content of each inorganic impurity in the washing water is made to be less than 1 ppm.

3,917,806

METHOD FOR THE PREPARATION OF CARBON MOLDINGS AND ACTIVATED CARBON MOLDING THEREFROM

Yasuo Amagi; Yasushi Nishimura, and Yasuo Uehara, all of Tokyo, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha and Toyo Boseki Kabushiki Kaisha, both of Tokyo, Japan

Filed Sept. 27, 1973, Ser. No. 401,160

Int. Cl.[2] C01B *31/02, 31/10;* **B01J** *21/18*

U.S. Cl. 423—449 **10 Claims**

1. A method of converting pitch into a formed porous carbon material, including the steps of forming pitch into shapes, oxidizing the formed shapes at a temperature of room temperature to 400°C to make the pitch infusible, and carbonizing the infusibilized shaped pitch in an inert atmosphere at a temperature higher than 600°C, wherein the improvement comprises the combination of steps of:

a. selecting a hydrocarbon pitch starting material having a softening point of 50°–350°C., a carbon content of 80–97, a hydrogen/carbon ratio of 0.3–2.5, and a nitrobenzene-insoluble fraction of less than 60%;

b. mixing said pitch starting material prior to said forming step with from 5 to 50 parts by weight of aromatic hydrocarbon per 100 parts of said pitch, said aromatic hydrocarbon being those having a boiling point of at least 200°C. and containing from 2 to 3 aromatic rings, said mixing being carried out with sufficient heating to form a fluidized mix which is subjected to said forming step to obtain said formed shapes; and

c. contacting the thus-produced formed shapes with a liquid organic solvent in which said aromatic hydrocarbon is soluble, said solvent being further characterized by the property that said pitch is substantially insoluble therein, said contacting extracting said aromatic hydrocarbon to increase the porosity of said formed shapes prior to said steps of oxidizing and carbonizing thereof.

3,917,807

METHOD FOR PRODUCING ANHYDROUS SODIUM DITHIONITE

Masayuki Yasue, Nara; Sizuo Saito, Toyonaka; Sumio Shimojo, Suita, and Kazuhisa Shiode, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Filed Oct. 26, 1970, Ser. No. 84,187

Claims priority, application Japan, Oct. 30, 1969, 44-87458; Feb. 5, 1970, 45-10528

Int. Cl.[2] C01B *17/66*

U.S. Cl. 423—515 **5 Claims**

1. In the preparation of anhydrous sodium dithionite by a process wherein sulfur dioxide is mixed with sodium formate and an alkali metal compound, the method which produces anhydrous sodium dithionite of improved particle size which comprises adding a methanol solution of sulfur dioxide to a solution or suspension of sodium formate and an alkali metal compound in two steps with from about 10 % to about 75 % by weight of the total sulfur dioxide used being mixed with the solution or suspension of sodium formate and alkali metal compound at a temperature of 70°C. to 150°C. in the first step

and the remainder of the sulfur dioxide being added in a second step at a lower temperature within the range of 60°C. to 85°C.

RJB ALH

3,917,808
METHOD FOR EXTRUDING ALUMINA

Bruce E. Leach, and George G. Hritz, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Continuation-in-part of Ser. No. 298,169, Oct. 16, 1972, abandoned. This application Feb. 5, 1973, Ser. No. 329,925
Int. Cl. C01f *7/02*
U.S. Cl. 423—626 **10 Claims**

1. A method for producing alpha alumina monohydrate extrudates, said method consisting essentially of:

a. admixing with alpha alumina monohydrate from about 0.01 to about 1.1 equivalents per kilogram of Al_2O_3 of a monoprotic acid, selected from the group consisting of hydrochloric acid, nitric acid, formic acid, propionic acid, monochloroacetic acid, dichloroacetic acid, trichloroacetic acid and salts of said acids wherein the cationic portion of said salts is selected from the group consisting of metallic ions and ammonium, from about 0.01 to about 2.75 equivalents per kilogram of Al_2O_3 of a polyprotic acid selected from the group consisting of oxalic acid, malonic acid, sulfuric acid, succinic acid, glutaric acid, adipic acid, maleic acid, fumaric acid, tartaric acid, salts of said acids wherein the cationic portion of said salts is selected from the group consisting of metallic ions and ammonium and anhydrides of maleic, succinic, glutaric and adipic acid and from about 0.4 to about 1.8 liters per kilogram of Al_2O_3 of water to form a putty-like extrudable mixture,

b. extruding said mixture, and

c. recovering alpha alumina monohydrate extrudates.

3,917,809
PREPARATION OF BERYLLIUM HYDRIDES

Jawad H. Murib; Stuart Schott, and Charles A. Bonecutter, all of Cincinnati, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 316,532, Oct. 16, 1963, abandoned. This application Sept. 30, 1968, Ser. No. 763,968
Int. Cl. C01b *6/00*
U.S. Cl. 423—645 **7 Claims**

1. A process for the production of beryllium hydride which comprises disproportionatng a haloberyllium hydride-Lewis base complex having the formula:

$$XBeH:Z_n$$

wherein X is a halogen selected from the group consisting of chlorine, bromine and iodine, Z is a Lewis base which does not contain a protonic hydrogen and n is 0.5 to 2, and recovering solid beryllium hydride.

3,917,810
PROCESS FOR PURIFYING ELECTROLYTIC HYDROGEN

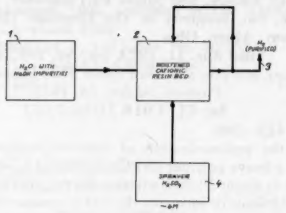
Corneliu Todereanu; Iustin-Gheorghe Dimitriu; Ioan-Romulus Filip, and Diona Ichim, all of Rimnicu Vilcea, Romania, assignors to Grupul Industrial de Chimie, Rimnicu Vilcea, Romania

Continuation-in-part of Ser. No. 421,499, Dec. 3, 1973, abandoned, Continuation of Ser. No. 206,889, Feb. 10, 1971, abandoned. This application Jan. 30, 1975, Ser. No. 545,747
Int. Cl.² C01B *1/26, 1/28*
U.S. Cl. 423—648 **4 Claims**

1. A process for the production of hydrogen suitable for use in catalytic hydrogenation of organic compounds, comprising the steps of:

a. deriving a stream of electrolytic hydrogen entraining 1 to 20 mg of sodium hydroxide per m^3 of hydrogen (STP) from an electrolytic hydrogen-production cell; and

b. contacting the electrolytic hydrogen containing the sodium hydroxide impurity with a moistened layer of a

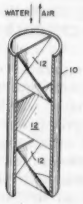


cationic resin of the R-H type to remove sodium ion, said resin used in volume of about 0.75 m^3/**1000** m^3 of purified hydrogen (STP).

3,917,811
INTERACTIVE SURFACE MIXER

Kenneth M. Grout, Topsfield, and Richard D. Devellian, Rockport, both of Mass., assignors to Kenics Corporation, North Andover, Mass.

Division of Ser. No. 81,869, Oct. 19, 1970, Pat. No. 3,775,063. This application June 25, 1973, Ser. No. 372,978
Int. Cl.² B01J *1/00*
U.S. Cl. 423—659 **1 Claim**



1. The process of producing a physiochemical change of state interaction between a fluid and a material which is physiochemically interactive with such fluid, which process comprises:

a. coating internal surfaces of an elongated conduit with said material

b. flowing a stream of said fluid through said conduit at laminar flow velocities below turbulence levels;

c. splitting said stream into two components;

d. directing the flow of each of said components in a helical path within a limited length of said conduit;

e. splitting each of said components at the end of said limited length into two additional components;

f. directing the flow of each of said additional components in a helical path of opposite sense to said first mentioned helical path within an additional limited length of said conduit;

g. the flowing of said fluid along said helical paths causing said fluid to flow successively toward and away from said coated internal surfaces of said conduit in a direction transverse to the general direction of flow of said stream, whereby said physiochemical change of state is generated between the fluid thus brought into contact with said surfaces and the material coated on said surfaces; and

h. discharging said fluid from said conduit after its components have been subjected to a plurality of said helical flow reversals.

3,917,812
COMPOSITIONS AND METHOD FOR DIAGNOSING DISEASES OF THE PANCREAS

Heinrich Woog, Ludwigshafen (Rhine), and Werner Rothe, Hockenheim, both of Germany, assignors to Boehringer Manheim GmbH, Manheim-Waldhof, Germany

Filed Mar. 6, 1974, Ser. No. 448,792

Claims priority, application Germany, Mar. 22, 1973, 2314270

Int. Cl.[2] A61K *29/00*; **G01N** *31/22, 33/16*

U.S. Cl. 424—7 **12 Claims**

1. Diagnostic composition containing fluorescein dilauryl ester, which composition comprises a hard gelatine capsule containing (a) a granulate and (b) an outer phasae surrounding the granulate and coated thereon, wherein said granulate comprises 10 to 63% of said fluorescein dilauryl ester, 6 to 13% of sodium carboxymethylamylopectin, 3 to 7% of microcrystalline cellulose and 8 to 18% of polyvinylpyrrolidone and the outer phase comprises a mixture of magnesium stearate, talc and lactose.

3,917,813
ORAL DRUG PREPARATIONS

Arne Martinus Pedersen, Vanlose, Denmark, assignor to A/S Alfred Benzon, Copenhagen, Denmark

Filed Mar. 20, 1974, Ser. No. 453,032

Int. Cl.[2] A61K *27/12*

U.S. Cl. 424—20 **3 Claims**

1. An oral drug preparation having a protracted effect and a substantially constant rate of release of the drug, comprising an admixture, of a drug and an effective amount of a buffer acid, buffer acid salts, and mixtures thereof, in the form of small spheroidal particles of 0.1 to 5 mm diameter, said particles having a coating thereon of a film-forming ethyl cellulose drug-diffusing dragee lacquer, allowing for diffusion of the stomach and intestinal juices through the coating, but not being soluble in said juices.

3,917,814
INSECTICIDAL COMPOSITION AND METHOD OF PREPARING THE SAME

Kenneth B. Hedges, 27128 Freeport Road, Palos Verdes Peninsula, Calif. 90274, and William R. Belford, P.O. Box 1323, Torrance, Calif. 90505

Continuation-in-part of Ser. No. 872,404, Oct. 29, 1969, abandoned, and a continuation-in-part of Ser. No. 522,831, Jan. 25, 1966, abandoned. This application Dec. 13, 1971, Ser. No. 207,528

Int. Cl. A01n *9/00*; **A61k** *9/00*

U.S. Cl. 424—23 **9 Claims**

1. A non-poisonous insecticidal powdered composition useful as a sorptive dust insecticide, effective on contact with the insect's waxy epicute, comprising inorganic sorptive particles within the range of from about 100 to about 400 mesh Tyler screen size and having adhered to the surface thereof a sorptive silica gel, said silica gel constituting at least about 0.1 percent by weight of the total weight of the coated particles and said composition having a packed bulk density from about 15 to about 100 lbs/feet^3.

3,917,815
COSMETIC COMPOSITIONS CONTAINING N-OXYPYRIDYL DERIVATIVES

Gregoire Kalopissis, Paris, and Claude Bouillon, Eaubonne, both of France, assignors to L'Oreal, Paris, France

Continuation-in-part of Ser. No. 69,936, Sept. 4, 1970, abandoned. This application Apr. 5, 1974, Ser. No. 458,444

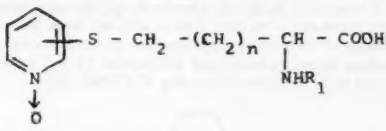
Claims priority, application Luxembourg, Sept. 4, 1969, 59405; Feb. 20, 1970, 60384; Australia, Sept. 4, 1970, 19609/70; United Kingdom, Sept. 4, 1970, 42608/70; Spain, Sept. 3, 1970, 383354; Canada, Sept. 3, 1970, 92484; Sweden, Sept. 3, 1970, 12008/70

Int. Cl.[2] A61K *7/06, 7/36, 7/38, 31/44*

U.S. Cl. 424—45 **9 Claims**

3. A pressurized sprayable aerosol composition having fungicidal, bactericidal and antidandruff characteristics for application to the hair, scalp or skin in order to combat the greasy and unaesthetic appearance of the hair and scalp and to counteract the formation of body odours, said composition comprising in admixture with a member selected from the group consisting of a lower alkanol, water, a cosmetic powder and propylene glycol, an active component selected from the group consisting of

a. a compound of the formula



wherein *n* is equal to 0 or 1, the sulfur atom being attached to the N-oxypyridyl nucleus in a position ortho or para to the NO group, and R_1 represents a member selected from the group consisting of hydrogen, COR_2 and SO_2R_2 wherein R_2 is selected from the group consisting of alkyl having 1–4 carbon atoms, phenyl and tolyl;

b. the metal complex of the compound in (a) when R_1 is hydrogen, said metal being zinc, iron, cadmium or manganese; and

c. the metal salt of the compound in (a) when R_1 is selected from the group consisting of COR_2 and SO_2R_2, said metal being zinc, iron, manganese, tin, cadmium, titanium, aluminium, molybdenum, sodium, potassium, calcium, barium or lithium, said active component being present in amounts of about 0.01–10 percent by weight of said admixture,

and a halogenated hydrocarbon aerosol propellant present in amounts of about 2–3 times the weight of said admixture.

3,917,816
PROTEIN CONDITIONER

Mao H. Yueh, Minneapolis, Minn., assignor to General Mills Chemicals, Inc., Minneapolis, Mich.

Filed May 26, 1970, Ser. No. 40,743

Int. Cl.[2] A61K *7/04, 7/09, 7/11*

U.S. Cl. 424—61 **7 Claims**

1. A conditioning solution for hair, skin and fingernails consisting essentially of an alcohol having from 1 to 3 carbon atoms and fish milt protamine, said protamine being present in an amount of from 0.1 to 20 percent by weight based on the total weight of the solution, said protamine being dissolved in said alcohol, said alcohol soluble protamine having been prepared by dispersing finely divided particles of fish milt material in water, adding an organic or an inorganic salt to said dispersion in an amount sufficient to produce a thickened solution, adding an alkaline material to raise the pH to a point at which the protamine precipitates from the solution, and removing the protamine from the water.

3,917,817

HAIR TREATING COSMETIC COMPOSITIONS CONTAINING PIPERAZINE BASED CATIONIC POLYMER

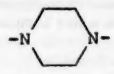
Guy Vanlerberghe, Montjay-la-Tour par Claie-Souilly, and Henri Sebag, Paris, both of France, assignors to L'Oreal, Paris, France

Filed Nov. 28, 1972, Ser. No. 310,088
Claims priority, application Luxembourg, Nov. 29, 1971, 064371
Int. Cl.[2] A61K 7/06
U.S. Cl. 424—70 7 Claims

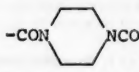
1. Cosmetic composition for conditioning the hair comprising a solution in a solvent selected from the group consisting of water and water-lower alkanol, of a member selected from the group consisting of

1. a film-forming cationic polymer having a molecular weight of about 1,000 to 15,000 and having the formula —A—Z—A—Z—A—Z—

wherein A represents



and Z represents B and B′ wherein B and B′ each independently represent a bivalent radical selected from the group consisting of (i) hydroxypropylene, (ii) alkylene having up to 5 carbon atoms inclusive and interrupted by 1–2 members selected from the group consisting of -CONH and



(iii) hydroxy alkylene wherein the alkylene moiety has up to 6 carbon atoms inclusive and interrupted by a member selected from the group consisting of alkylamine wherein the alkyl moiety has 12–16 carbon atoms, benzylamine, oleylamine and oxygen, and (iv) hydroxy propyl-piperazinyl-hydroxypropyl,

2. quaternary ammonium salt of the cationic polymer in (1) and

3. the oxidation product of the cationic polymer in (1),

said member being present in an amount of about 0.1 to 5 percent by weight of said composition.

3,917,818

TREATMENT OF MASTITIS IN COWS, THE PRODUCT FOR THIS TREATMENT AND TO THE PRODUCTION OF SAID PRODUCT

Hendrik Jacobus Weideman Botes, Kameeldrift, South Africa, assignor to Agricura Laboratoria Limited, Silverton, South Africa

Continuation of Ser. No. 2,974, Jan. 14, 1970, abandoned.
This application Nov. 9, 1972, Ser. No. 305,048
Int. Cl.[2] A61K 39/40
U.S. Cl. 424—87 10 Claims

1. A composition for the treatment of bovine mastitis comprising an effective amount of immuno-globulin obtained from blood pooled from cows suffering from mastitis in admixture with a pharmaceutically acceptable diluent.

3,917,819

METHOD FOR PREVENTING RESPIRATORY MYCOPLASMOSIS OF LIVESTOCKS

Morimasa Yoshioka, and Eizo Hayatsu, both of Tokyo, Japan, assignors to The Kitasato Institute, Tokyo, Japan

Filed Sept. 17, 1973, Ser. No. 397,909
Claims priority, application Japan, Oct. 5, 1972, 47-100028
Int. Cl.[2] C12K 5/00
U.S. Cl. 424—88 18 Claims

1. A suspension of killed Mycoplasma vaccine for immunizing respiratory mycoplasmosis of livestock and consisting essentially of formalin killed ultrasonically homogenized Mycoplasma cell, a physiologically acceptable aqueous medium of pH 6.0 to 7.8, and a suspension stabilizer.

3,917,820

ANTIBIOTIC COCHLIODINOL AND PRODUCTION BY CHAETOMIUM, COCHLIODES AND CHAETOMIUM GLOBSUM

Donald Brewer, Halifax, Canada; William Arthur Jerram, Melbourne, Australia, and Alan Taylor, Dartmouth, Canada, assignors to Canadian Patents & Development Ltd., Ottawa, Canada

Continuation of Ser. No. 829,053, May 29, 1969, abandoned.
This application Feb. 25, 1972, Ser. No. 229,547
Int. Cl. A61k 27/00
U.S. Cl. 424—122 2 Claims

1. A compound cochliodinol, having a melting point of 206°–208°C., a molecular weight of about 508, an average elemental analysis generally corresponding to $C_{32}H_{32}N_2O_4$, infra-red, visible, and ultraviolet absorption spectra as shown in FIGS. 2 and 3 of the drawing, derived from a member selected from the group consisting of Chaetomium cochliodes HLX 366, Chaetomium cochliodes HLX 374 D, Chaetomium cochliodes HLX 374 W., Chaetomium globsum HLX 707, and Chaetomium globsum HLX 819.

3,917,821

PALATABLE ACTIVATED CARBON

Milton Manes, 1613 Chadwick Drive, Kent, Ohio 44240

Filed Oct. 23, 1973, Ser. No. 409,002
Int. Cl.[2] A61K 33/44
U.S. Cl. 424—125 13 Claims

1. In a process for orally administering to a patient who has ingested a toxic substance susceptible to adsorption by activated carbon an aqueous slurry of activated carbon with the carbon being in an amount sufficient to adsorb the toxic substance, the improvement comprising improving the palatability of the carbon without significantly reducing the adsorptive power of the activated carbon by administering to said patient pulverized activated carbon of a particle size of up to 150 microns in water containing a non-toxic water soluble polysaccharide thickening agent selected from the group consisting of sodium carboxymethyl cellulose, carboxymethyl cellulose, alginic acid, sodium alginate, potassium alginate, ammonium alginate, carragheenan, dextran, xanthan and guar gum, said thickening agent being present in an aqueous solution in an amount of 0.3 to 5% and the ratio of carbon to thickener solution is 1 gram of carbon to from 2.5 to 20 ml of thickener solution.

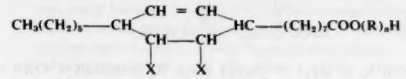
3,917,822

IODINE-CONTAINING ANIONIC SANITIZERS

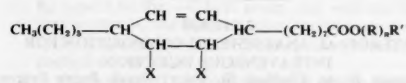
George Holbrook Turney, King of Prussia, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

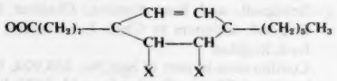
Filed July 29, 1974, Ser. No. 492,668
Int. Cl.[2] A01N 11/00
U.S. Cl. 424—150 11 Claims

1. The anionic iodophor composition consisting essentially of a polyalkylene oxide glycol monoester of C-21 dicarboxylic acid represented by the structural formula



or





where R is ethylene oxide, propylene oxide or mixed ethylene-propylene oxides in random distribution or block groups, X is hydrogen and the other X is carboxylic, *n* is about 3 to about 34, R′ is ethylene or propylene, and having a mole ratio of polyalkylene oxide glycol to C-21 dicarboxylic acid within the range of about 1 to 1 to about 1 to 2, said monoester containing from about 1 to about 47% by weight available iodine.

3,917,823

PESTICIDE COMPRISING ALUMINUM PHOSPHIDE

Wolfgang Kapp, Offenbach, Germany, assignor to Deutsche Gesellschaft fur Schadlings-bekampfung mbH, Frankfurt, Germany

Filed July 15, 1974, Ser. No. 488,596

Int. Cl.² A01N *11/00*

U.S. Cl. 424—128 **18 Claims**

1. A pesticidal composition comprising the pesticide aluminum phosphide and a compound selected from the group consisting of a dry alkali metal oxide, a dry alkali metal hydroxide and mixtures thereof, said alkali metal oxide or hydroxide comprising about 10 to about 50% by weight of said pesticide.

3,917,824

PHARMACEUTICAL COMPOSITIONS CONTAINING EPIDERMAL GROWTH FACTOR OR CLOSELY RELATED DERIVATIVES THEREOF FOR INHIBITING THE SECRETION OF ACIDIC GASTRIC JUICE IN WARM BLOODED ANIMALS

Roger Camble; Harold Gregory, and Ernest Edward Lawrence Gerring, all of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Feb. 19, 1974, Ser. No. 443,770

Claims priority, application United Kingdom, Mar. 28, 1973, 14850/73; Apr. 2, 1973, 15706/73

Int. Cl.² A61K *37/00*; C07C *103/52*

U.S. Cl. 424—177 **2 Claims**

1. A method of inhibiting the secretion of acidic gastric juice in warm blooded animals which require such treatment, which comprises administering by injection to the warm blooded animal a therapeutically effective amount of EGF, 1–47 EGF, 1–48 EGF or 1–51 EGF, or a reduction product of EGF, 1–47 EGF, 1–48 EGF or 1–51 EGF in which the cystine residues are reduced to cysteine.

3,917,825

PREPARATION FOR RECTAL OR VAGINAL ADMINISTRATION CONTAINING LH-RH OR ITS ANALOGS

Tai Matsuzawa, Osaka; Shin-ichiro Hirai, Kyoto; Masahiko Fujino, Hyogo; Shigeru Kobayashi, Osaka, and Iwao Yamazaki, Hyogo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Japan

Filed Oct. 12, 1973, Ser. No. 406,174

Claims priority, application Japan, Oct. 12, 1972, 47-102500

Int. Cl.² A61K *37/00*

U.S. Cl. 424—177 **12 Claims**

1. Preparation for rectal or vaginal administration essentially comprising a nona- or deca-peptide, having luteinizing hormone-releasing activity, of the formula: (Pyr)Glu-His-Trp-Ser-A_1-Gly-A_2-Arg-Pro-Y wherein A_1 is Tyr or Phe; A_2 is Leu, Nle, Ile or Met; and Y is -NHC_2H_5, -NH-C_2H_4OH,

or -Gly-NH_2 dispersed homogeneously in an oleaginous base and a non-ionic surfactant which is a polyoxyethylene higher alcohol ether having 8 to 18 carbon atoms.

3,917,826

PESTICIDE USES OF SUBSTITUTED FLUOROPHOSPHAZENES

Heinrich Adolphi, Limburgerhof; Gerd Wunsch, Speyer, and Volker Kiener, Ludwigshafen, all of Germany, assignors to BASF Aktiengellschaft, Ludwigshafen (Rhine), Germany

Filed June 26, 1974, Ser. No. 483,242

Claims priority, application Germany, July 7, 1973, 2334714

Int. Cl.² A01N *9/36*

U.S. Cl. 424—204 **8 Claims**

1. A process for killing insects which comprises contacting the insects with an insecticidally effective amount of a substituted fluorophosphazene of the formula

$$N_3P_3F_n(XR)_{6-n}$$

where X denotes sulfur, in which case R denotes methyl, ethyl or phenyl and n denotes 2, 3, 4 or 5, or X denotes oxygen, in which case R denotes phenyl or ethyl and *n* is 5.

3,917,827

A METHOD FOR KILLING INSECTS AND MITES

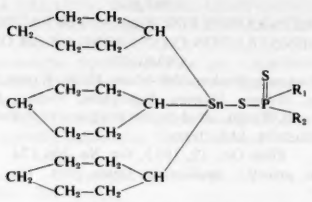
Don R. Baker, Orinda, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 304,871, Oct. 19, 1972, Pat. No. 3,832,370. This application May 6, 1974, Ser. No. 466,930

Int. Cl.² A01N *9/36*

U.S. Cl. 424—210 **26 Claims**

1. The method which comprises killing insects and mites by contacting them with an insecticidally and miticidally effective amount of a compound of the formula



wherein R_1 is lower alkyl having 1 to 4 carbon atoms, and R^2 is

wherein R_3 and R_4 can be the same or different and is selected from the group consisting of hydrogen, alkyl having 1 to 15 carbon atoms, methoxyethyl, allyl, benzyl, cyanoethyl, hydroxy-ethyl, phenyl, ethylphenyl sulfonamidophenyl, and chloro-benzyl, provided that when R_3 is hydrogen, R_4 is other than hydrogen.

3,917,828
METHOD OF REDUCING THE UNDESIRABLE GASTRAINTESTINAL EFFECTS OF PROSTAGLANDIN SYNTHETASE INHIBITORS

Andre Robert, Kalamazoo Twp., Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Jan. 28, 1974, Ser. No. 437,445
Int. Cl.² A61K *31/19, 31/40, 31/415, 31/61*
U.S. Cl. 424—234 **9 Claims**

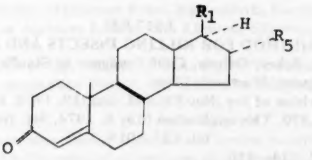
1. The method of systemic administration of an anti inflammatory prostaglandin synthetase inhibitor to a mammal, the improvement which comprises concomitant systemic administration of an effective amount of a prostaglandin of the PGF type, pharmaceutically acceptable salt or ester thereof, to reduce the undesirable gastrointestinal effects of the prostaglandin synthetase inhibitor.

3,917,829
NOVEL METHODS OF INHIBITING THE ACTIVITY OF TESTOSTERONE 5α-REDUCTASE

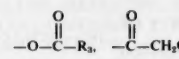
Walter Voigt, and Sung Lan Hsia, both of Miami, Fla., assignors to Research Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 201,592, Nov. 8, 1971. This application Aug. 20, 1973, Ser. No. 389,741
Claims priority, application Canada, Nov. 8, 1972, 156016
Int. Cl.² A61K *31/56*
U.S. Cl. 424—242 **6 Claims**

1. A method of inhibiting the activity of testosterone 5 -reductase in androgen sensitive organs of the group consisting of the prostate glands, the sebaceous glands and the seminal vesicals by administering to a mammal in need of such inhibition, between 1 and 10 mg/Kg/day of a compound of the formula:



wherein $-R_1$ is selected from the group consisting of —COOH, $-COOR_2$,



wherein R_2 is alkyl or phenyl alkyl, R_3 is haloalkyl, OR4 is hydroxy or alkanoyloxy, and R_5 is hydrogen or fluoro, wherein "alk" signifies 1–5 carbon atoms.

3,917,830
STEROIDAL ANAESTHETIC COMPOSITION FOR INTRAVENEOUS INJECTION

Benjamin Davis, Chalfont St. Peter; Derek Roger Pearce, Bracknell, and Paul Connor, Chalfont St. Giles, all of England, assignors to Glaxo Laboratories Limited, Greenford, England

Continuation-in-part of Ser. No. 208,924, Dec. 16, 1971, abandoned. This application June 15, 1972, Ser. No. 263,133
Claims priority, application United Kingdom, Dec. 17, 1970, 60067/70
Int. Cl.² A61K *17/00*
U.S. Cl. 424—243 **4 Claims**

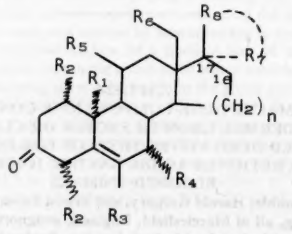
1. A composition adapted for use in medicine by intravenous injection as an anaesthetic comprising 3α-hydroxy-5α-pregnane-11,20-dione in solution in an inert liquid injection medium consisting essentially of a solution of water in an organic liquid selected from the group consisting of a polyhydric alcohol having 2 or 3 hydroxy groups and 1–6 carbon atoms and a water soluble ester of an α-hydroxy carboxylic acid and an alkanol having 1–6 carbon atoms in which the organic liquid constitutes more than 50% of the total injection medium, said composition being in unit dosage form, each dosage containing 10 to 300 mg of the 3α-hydroxy-5α-pregnane-11,20-dione.

3,917,831
3-KETO-7 α,β-LOWERALKYL-Δ 5-STEROIDS

Joyce F. Grunwell; Harvey D. Benson, and Vladimir Petrow, all of Cincinnati, Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.

Division of Ser. No. 236,186, March 20, 1972, Pat. No. 3,833,621. This application June 4, 1974, Ser. No. 476,330
Int. Cl.² A61K *31/56*
U.S. Cl. 424—243 **8 Claims**

1. A pharmaceutical composition in unit dosage form comprising from 0.1 milligram to 3.0 grams of a compound having the formula

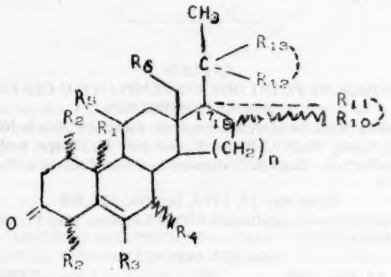


wherein

R_1 is selected from the group consisting of hydrogen and (α or β)-methyl with the proviso that when R_1 is α-methyl the 9-hydrogen is in the β-position, and when R_1 is β-methyl the 9-hydrogen is in the α-position, R_2 is individually selected from the group consisting of hydrogen and (α or β)-methyl, R_3 is hydrogen or methyl, R_4 is an (α or β)-loweralkyl group having from 1 to 3 carbon atoms inclusively, R_5 is hydrogen or oxo, R_6 is selected from the group consisting of hydrogen, methyl and ethyl, R_7 is selected from the group consisting of hydrogen, loweral-

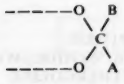
kyl, alkenyl, alkynyl, alkadienyl, alkenylnyl and alkadiynyl, each haveing from 1 to 6 carbon atoms inclusively, R_8 is selected from the group consisting of hydrogen, 1-cyclopenten-1-yloxy, 1-methoxycyclohexyloxy, 2-tetrahydropyranyloxy, and the group $—OR_9$, wherein R_9 represents hydrogen or an acyl radical having from 1 to 12 carbon atoms inclusively with the proviso that R_7 and R_8 cannot both be hydrogen, that when R_7 is unsaturated R_8 cannot be the —OAcyl group, and with the further proviso that R_7 and R_8 when taken together are oxo or a cyclic ethylene acetal, *n* is the integer 1, and a pharmaceutical carrier.

5. A pharmaceutical composition in unit dosage form comprising from 0.1 milligram to 3.0 grams of a compound having the formula



wherein

R_1 is selected from the group consisting of hydrogen and (α or β)-methyl with the proviso that when R_1 is α-methyl the 9-hydrogen is in the β-position, and when R_1 is β-methyl the 9-hydrogen is in the α-position, R_2 is individually selected from the group consisting of hydrogen and (α or β)-methyl, R_3 is hydrogen or methyl, R_4 is (α or β)-loweralkyl group having 1 to 3 carbon atoms inclusively, R_5 is hydrogen or oxo, R_6 is selected from the group consisting of hydrogen, methyl and ethyl, R_{10} is selected from the group consisting of hydrogen, methyl and methylene, R_{11} is selected from the group consisting of hydrogen, methyl, ethyl, 2-tetrahydropyranyloxy and the group $—OR_9$, wherein R_9 represents hydrogen, a loweralkyl group having from 1 to 3 carbon atoms inclusively, and an acyl radical having from 1 to 12 carbon atoms inclusively, with the proviso that when R_{10} is methylene, R_{11} cannot be the —O—acyl group, and with the further proviso that R_{10} and R_{11} when taken together represent the 16α,17α-alkylidenedioxy group



wherein A and B are each loweralkyl having from 1 to 4 carbon atoms inclusively, R_{12} is selected from the group consisting of hydrogen, 1-cyclopenten-1-yloxy, 1-methoxycyclohexyloxy, 2-tetrahydropyranyloxy and the group $—OR_9$, wherein R_9 represents hydrogen and an acyl radical having from 1 to 12 carbon atoms inclusively, and which when taken together with R_{13} is oxo, R_{13} is hydrogen with the proviso that R_{12} and R_{13} cannot both be hydrogen, and which when taken together with R_{12} is oxo, n is the integer 1, and a pharmaceutical carrier.

3,917,832
COMPOSITIONS COMPRISING D-THYROXINE AND D-TRIIODOTHYRONINE

Franz Adolf Horster, Hilden, Germany, assignor to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

Filed Sept. 24, 1971, Ser. No. 183,663

Claims priority, application Germany, May 28, 1971, 2126533

Int. Cl.² A61K *27/00*

U.S. Cl. 424—319 **4 Claims**

1. A pharmaceutical composition useful for the treatment of hyperlipidemia comprising, per unit dosage, 0.2 – 4 mg. of d-thyroxine or a physiologically acceptable salt thereof and 0.05 – 1 mg. of d-triiodothyronine or a physiologically acceptable salt thereof, in a weight ratio of the former to the latter of about 4:1, and at least one solid, liquid or semi-liquid pharmaceutically acceptable carrier.

3,917,833
AMINO-SUBSTITUTED BENZOCYCLOHEPTENONES FOR INDUCING SLEEP

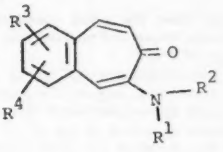
Eugene E. Galantay, Liestal, Switzerland, assignor to Sandoz, Inc., E. Hanover, N.J.

Filed Feb. 26, 1973, Ser. No. 335,594

Int. Cl.² A61K *31/135*

U.S. Cl. 424—330 **8 Claims**

1. A method for inducing sleep in a mammal, comprising orally administering to said mammal in need of said treatment, an effective amount for inducing sleep in said mammal of a compound selected from the group consisting of a 7-keto compound of the formula



wherein

each of R^1 and R^2, independently, is a hydrogen atom, or lower alkyl; and

each of R^3 and R^4, independently, is a hydrogen atom, a halogen atom having an atomic weight of from about 19 to 80, nitro, lower alkyl, lower alkoxy, or trifluoro (lower) alkyl; and non-toxic pharmaceutically acceptable acid addition salts thereof.

3,917,834
N-2-NITROBUTYL MORPHOLINE AND HEXACHLORO-IMETHYL SULFONE AS A SLIME CONTROL COMPOSITION

Bernard F. Shema, Glenside; Robert H. Brink, Jr., Doylestown, and Paul Swered, Philadelphia, all of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed May 30, 1973, Ser. No. 365,385

The portion of the term of this patent subsequent to May 23, 1989, has been disclaimed.

Int. Cl.² A01N *9/00, 9/22*

U.S. Cl. 424—248 **8 Claims**

1. A composition for the control of Aerobacter aerogenes in aqueous systems comprising N-2-nitrobutyl morpholine and hexachloro dimethyl sulfone, wherein the weight ratio of the morpholine to the sulfone ranges from about 5:95 to about 95:5 respectively.

3,917,835

A METHOD OF PREVENTING ASTHMATIC SYMPTOMS

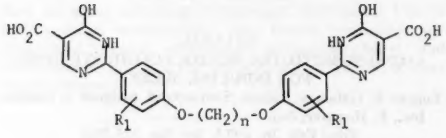
Wayne E. Barth, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 299,871, Oct. 24, 1972. This application Jan. 14, 1975, Ser. No. 541,009

Int. Cl.[2] A61K *31/505*

U.S. Cl. 424—251 5 Claims

1. A method of preventing asthmatic symptoms in a mammal subject to bronchoconstriction which comprises administrating to said mammal an asthmatic symptom preventing amount of a compound selected from the group consisting of the formula:



and the pharmaceutically acceptable basic salts thereof wherein

R_1 is selected from the group consisting of hydrogen, chloro, bromo, fluoro and methoxy and

n is an integer of 1 to 3.

3,917,836

ANTITUSSIVUM

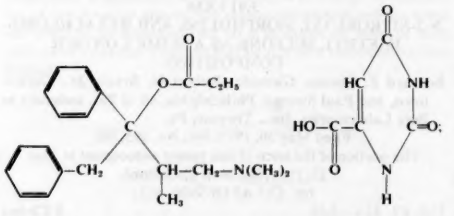
Helmuth Wawretschek, Berlin, Germany, assignor to Servomed Arznei GmbH & Co Pharma KG, Germany

Filed Mar. 25, 1974, Ser. No. 454,501

Int. Cl.[2] A61K *31/505, 31/135*

U.S. Cl. 424—251 9 Claims

1. An antitussive composition comprising an effective antitussive amount of an agent selected from the group consisting of: L-α-1,2-diphenyl-2-propionoxy-3-methyl-4dimethyl amino butanehydroorotate of the formula:



a mixture of L-α-1,2-diphenyl-2-propionoxy-3-methyl-4-dimethyl amino butane-hydrochloride and orotic acid in a molar ratio of 1:1; and mixtures thereof in admixture with a pharmaceutically acceptable carrier.

3,917,837

METHOD OF USING TRANS-2-(6-AMINO-9H-PURIN-9-YL)-CYCLOPENTANOL

Yang-I Lin, and Leon Goldman, both of Nanuet, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Oct. 21, 1974, Ser. No. 516,565

Int. Cl.[2] A61K *35/52*

U.S. Cl. 424—253 1 Claim

1. The method of meliorating inflammation in a mammal which comprises administering internally to said mammal an effective amount of a compound selected from the group consisting of trans-2-(6-amino-9H-purin-9-yl)cyclopentanol and a non-toxic pharmaceutically acceptable acid-addition salt thereof.

3,917,838

CONTROL OF PLANT DISEASES EMPLOYING CERTAIN PYRROLS COMPOUNDS

Robert J. Bass, Birchington, England; Richard C. Koch, Niantic, Conn.; Hugh C. Richards, and John E. Thorpe, both of Canterbury, England, assignors to Pfizer Inc., New York, N.Y.

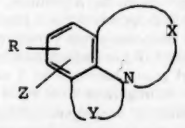
Filed May 17, 1973, Ser. No. 361,200

Claims priority, application United Kingdom, May 17, 1972, 23158/72

Int. Cl.[2] A01N *9/22*

U.S. Cl. 424—258 5 Claims

1. A method for the control of fungal and bacterial diseases of rice plants comprising contacting the plants, or the seeds thereof, with a fungicidally or bactericidally effective amount in a compatible diluent of a compound of the formula



or a non-phytotoxic acid addition salt thereof;

wherein X completes a saturated or unsaturated pyrido ring and Y completes a saturated or unsaturated pyrollo ring; X and Y are each unsubstituted or substitited with up to two substituents which are halo, lower alkyl, phenyl, oxo or thio;

R is hydrogen, lower alkyl, lower alkyl, lower alkoxy, lower alkanoyl, benzoyl, hydroxy, lower alkanoyloxy, cyano, or halo; and

Z is hydrogen or halo.

3,917,839

TREATMENT OF ETHANOL WITHDRAWAL SYMPTOMS WITH METHERGOLINE

Cyril Schneider, Twickenham, and Michael Douglas Hammond, Waterside, both of England, assignors to Miles Laboratories, Inc., Elkart, Ind.

Filed Jan. 17, 1974, Ser. No. 434,361

Claims priority, application United Kingdom, Feb. 7, 1973, 05947/73

Int. Cl.[2] A61K *31/48, 31/445*

U.S. Cl. 424—261 5 Claims

1. A method of preventing or suppressing ethanol withdrawal symptoms in an individual physically dependent on ethanol, which method comprises:

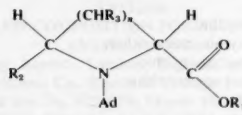
administering to said individual an effective amount of methergoline to prevent or suppress said symptoms.

3,917,840
COMPOSITIONS AND METHODS FOR TREATING PARKINSONISM

Elijah H. Gold, West Orange, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 90,474, Nov. 17, 1970, Pat. No. 3,810,884. This application Mar. 7, 1974, Ser. No. 449,138
Int. Cl.[2] A61K *9/22, 31/33, 31/445*
U.S. Cl. 424—267 **12 Claims**

1. A process for treating symptoms of parkinsonism which comprises administering to a mammal suffering from parkinsonism a therapeutically effective quantity of a composition of matter having the structural formula:



wherein Ad is 1-adamantyl; R_1 is hydrogen, lower alkyl or a pharmaceutically acceptable cation; R_2 is hydrogen or lower alkyl; *n* is an integer from 0 to 5; each R_3 is hydrogen, and the pharmaceutically acceptable acid addition salt thereof.

3,917,841
METHOD FOR TREATING LIBIDO DISORDERS

Kjell Fuxe, Sollentuna, Sweden, assignor to Nelson Research & Development Co., Irvine, Calif.

Filed June 3, 1974, Ser. No. 475,857
Int. Cl.[2] A61K *31/135, 31/195, 31/445*
U.S. Cl. 424—267 **2 Claims**

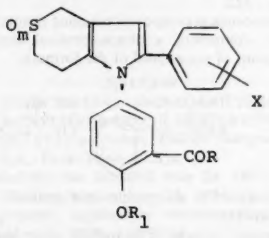
1. A method for enhancing libido in female domesticated animals for improved breeding purposes comprising administering to a domesticated female animal prior to breeding about 1 to about 250 mg/kg of a dopamine blocking agent selected from the group consisting of pimozide, fluspirilene and spiroperidol.

3,917,842
THIOPYRANOPYRROLYLSALICYLIC ACIDS AND DERIVATIVES THEREOF

Richard C. Allen, Somerville, N.J., and Chandler R. Taylor, Jr., Mechanicsville, Va., assignors to American Hoechst Corporation, Bridgewater, N.J.

Division of Ser. No. 336,920, March 1, 1973, Pat. No. 3,865,839. This application Aug. 13, 1974, Ser. No. 496,958
Int. Cl.[2] A61K *31/40*
U.S. Cl. 424—274 **26 Claims**

1. A method of treating inflammation and pain which comprises administering to a mammal an effective amount of an active compound of the formula



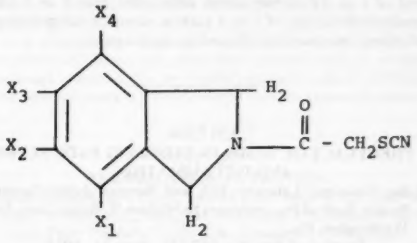
in which X is hydrogen, hydroxy, halogen, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, phenyl, nitro, amino, trifluoromethyl or cyano, R is hydroxy, alkoxy of 1 to 6 carbon atoms or amino, R_1 is hydrogen, alkyl of 1 to 6 carbon atoms or alkanoyl of 1 to 6 carbon atoms, and *m* is 0, 1 or 2.

3,917,843
FUNGICIDAL COMPOSITIONS AND METHODS OF COMBATTING FUNGI USING SUBSTITUTED ISOINDOLINES

Sidney B. Richter, Chicago, and Alfred A. Levin, Skokie, both of Ill., assignors to Velsical Chemical Corporation, Chicago, Ill.

Division of Ser. No. 297,533, Oct. 13, 1972, Pat. No. 3,839,577, which is a division of Ser. No. 176,771, July 26, 1971, which is a division of Ser. No. 732,822, May 29, 1968, abandoned. This application Mar. 21, 1974, Ser. No. 453,250
Int. Cl. A01n *9/22*
U.S. Cl. 424—274 **4 Claims**

1. A fungicidal composition comprising an inert carrier and a fungicidally effective amount of a compound



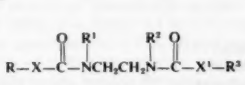
wherein X_1, X_2, X_3 and X_4, are independently selected from the group consisting of hydrogen, lower alkyl, chlorine, bromine, trifluoromethyl, lower alkoxy and nitro provided that only one of X_1, X_2, X_3 and X_4 is nitro or tertiary lower alkyl and that at least two of X_1, X_2, X_3 and X_4, are hydrogen.

3,917,844
CERTAIN NON-TERPENOID JUVENILE HORMONE MIMICKING COMPOUNDS AND THEIR USE IN CONTROLLING INSECTS

Ferenc Marcus Pallos, Walnut Creek, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 257,092, May 26, 1972, Pat. No. 3,846,466. This application July 25, 1974, Ser. No. 491,919
Int. Cl.[2] A01N *9/12, 9/20*
U.S. Cl. 424—300 **9 Claims**

1. A method of impeding the metamorphasis of *Tenebrio molitor* comprising applying thereto at any stage of its development a metamorphasis inhibiting amount of a compound of the formula



in which R is alkyl having 2 to 6 carbon atoms; R^1 is hydrogen or alkyl having 1 to 4 carbon atoms; R^2 is alkyl having 1 to 4 carbon atoms; R^3 is alkyl having 2 to 6 carbon atoms; X is sulfur and X^1 is sulfur.

3,917,845
O,S-DIHYDROCARBYL-N-ALKYLTHIO- OR N-ARYLTHIO PHOSPHOROAMIDOTHIOATES AS INSECTICIDES

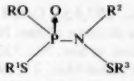
Melancthon S. Brown, deceased, late of Berkeley, Calif. (by Gustave K. Kohn, Special Administrator), assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 345,403, March 27, 1973, abandoned, which is a division of Ser. No. 155,292, June 21, 1971, Pat. No. 3,755,507. This application July 11, 1974, Ser. No. 486,122

Int. Cl. A01n *9/36*

U.S. Cl. 424—215 **28 Claims**

1. An insecticidal composition comprising an insecticidally effective amount of a compound of the formula



wherein R and R^1 are individually alkyl, alkenyl or alkynyl of up to 3 carbon atoms, R^2 is hydrogen, alkyl of 1 to 3 carbon atoms or $—SR^3$, and R^3 is alkyl of 1 to 4 carbon atoms substituted with 0 to 4 halogen atoms of atomic number 9 to 35 or aryl of 6 to 12 carbon atoms substituted with 0 to 4 alkyl groups individually of 1 to 4 carbon atoms or halogen atoms of atomic number 9 to 35, and an inert carrier.

3,917,846
PHENYLACETIC ACIDS IN REDUCING PAIN, FEVER AND INFLAMMATION

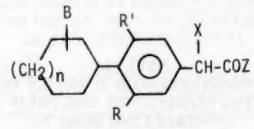
Julius Diamond, Lafayette Hill, and Norman Julian Santora, Roslyn, both of Pa., assignors to William H. Roher, Inc., Fort Washington, Pa.

Division of Ser. No. 152,451, June 11, 1971, Continuation-in-part of Ser. No. 34,870, May 5, 1970, Pat. No. 3,864,384. This application Feb. 6, 1974, Ser. No. 440,195

Int. Cl.² A61K *31/19, 31/20, 31/26, 31/27, 31/255*

U.S. Cl. 424—317 **5 Claims**

1. A method of reducing inflammation, pain or fever in mammals which comprises administering to a mammal a daily dosage of 0.5 to 100 mg/kg of body weight a compound having the formula



where:

n is 0-2;

B is hydrogen or loweralkyl;

R is halo, nitro, amino, acylamino, mono- and diloweralkylamino, mercapto, acylthio, loweralkylthio, loweralkylsulfinyl, loweralkylsulfonyl, hydroxy, loweralkoxy, acyloxy, halologweralkyl, cyano, acetyl or loweralkyl;

R′ is hydrogen, fluoro, chloro, bromo, trifluoromethyl, cyano, nitro or loweralkylsulfonyl

X is mercapto, acylthio, carboxyacylthio, aroylthio, carboxyaroylthio, loweralkoxythiocarbonylthio, loweralkoxycarbonylthio, arloweralkoxycarbonylthio, amidinothio, thiocyanato, thiosulfo, thioacylthio, carbamylthio, loweralkylcarbamylthio, diloweralkylcarbamylthio, loweralkylthio, loweralkylsulfinyl, loweralkylsulfonyl, sulfino or sulfo; and

Z is —OH or —OM where M is an alkali, alkaline earth or aluminum metal or an ammonium salt.

3,917,847
ALPHA-AMINOALKYL-4-HYDROXY-3-UREIDOBENZYL ALCOHOLS AS BRONCHODILATORS

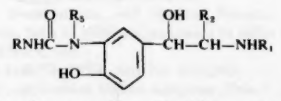
Carl Kaiser, Haddon Heights, N.J., and Stephen T. Ross, Berwyn, Pa., assignors to Smith Kline Corporation, Philadelphia, Pa.

Division of Ser. No. 105,698, Jan. 11, 1971, Pat. No. 3,763,232, which is a continuation-in-part of Ser. No. 12,151, Feb. 17, 1970, abandoned. This application May 29, 1973, Ser. No. 364,592

Int. Cl.² A61K *31/17*

U.S. Cl. 424—322 **19 Claims**

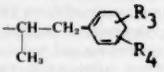
1. A pharmaceutical composition having β-adrenergic stimulant activity comprising a pharmaceutical carrier and an effective amount of compound of the formula:



or a pharmaceutically acceptable acid addition salt of said compound, wherein:

R is hydrogen, straight or branched chain lower alkyl of from 1 to 5 carbon atoms, phenyl, dimethylaminoethyl or dimethylaminopropyl;

R_1 is branched chain lower alkyl of from 3 to 5 carbon atoms, cycloalkyl or cycloalkylmethyl, the cycloalkyl moiety having from 3 to 6 carbon atoms,

or 

R_2 is hydrogen, methyl or ethyl;
R_3 and R_4 are hydrogen, hydroxy or methoxy; and
R_5 is hydrogen or methyl.

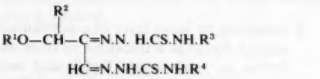
3,917,848

METHOD AND COMPOSITION FOR MANAGEMENT OF ANAPLASMOSIS

Paul Anthony Barrett, London, England, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

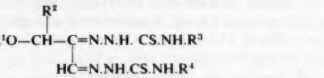
Division of Ser. No. 826,038, March 18, 1969, Pat. No. 3,709,935. This application Sept. 8, 1972, Ser. No. 287,337
Claims priority, application United Kingdom, Mar. 26, 1968, 14529/68
Int. Cl.² A61K *31/175*
U.S. Cl. 424—323 **41 Claims**

1. A pharmaceutical composition in unit dosage form suitable for oral or parenteral administration in the management of anaplasmosis in cattle containing an effective anaplasmosis treatment, prevention or sterilization amount of a compound of the formula



wherein R^1 is a methyl or ethyl group, R^2 is a hydrogen atom or a methyl group, and R^3 and R^4 are different, each being a hydrogen atom, a methyl, or an ethyl group in association with a pharmaceutically acceptable carrier therefor.

10. A method of sterilising carrier cattle infected with *A. marginale* of the A. marginale microorganism comprising the oral administration of the compound of the formula



wherein R^1 is a methyl or ethyl group, R^2 is a hydrogen atom or a methyl group, and R^3 and R^4 are different, each being a hydrogen atom, a methyl, or an ethyl group at a dosage of about 1 mg/kg. over a long period of time to the carrier animal.

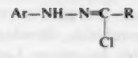
3,917,849

INSECTICIDAL AND ACARICIDAL PHENYLHYDRAZONE DERIVATIVES

Roger Boesch, Vitry-sur-Seine, France, assignor to Rhone-Poulenc, S.A., Paris, France

Division of Ser. No. 363,652, May 24, 1973, Pat. No. 3,839,445. This application Apr. 25, 1974, Ser. No. 464,212
Claims priority, application France, May 26, 1972, 72.18895; Mar. 19, 1973, 73.09753
Int. Cl.² A01N *9/20, 9/24*
U.S. Cl. 424—327 **21 Claims**

1. An insecticidal and acaricidal composition which contains, as the active ingredient, a phenylhydrazone derivative of the formula:



wherein R represents alkyl of 1 through 10 carbon atoms and Ar represents phenyl substituted by three substituents which may be the same or different and are selected from the group consisting of halogen, alkyl of 1 through 4 carbon atoms, alkoxy of 1 through 4 carbon atoms, alkenyloxy of 2 through 4 carbon atoms and alkynyloxy of 2 through 4 carbon atoms, at least one of the substituents on the phenyl radical being an alkoxy, alkenyloxy or alkynyloxy radical, in association with one or more diluents or adjuvants compatible with the phenylhydrazone derivative and suitable for use in agricultural insecticidal and acaricidal compositions, the quantity of phenylhydrazone derivative in the composition being 0.005 to 80% by weight of the composition.

3,917,850

BIOCIDAL SYNERGISTIC COMPOSITIONS FOR SURFACE AND SPACE DISINFECTION

Raymond Marcel Gut Boucher, New York, N.Y., assignor to Wave Energy Systems Inc., New York, N.Y.

Filed June 5, 1973, Ser. No. 367,124
Int. Cl.² A01N *9/24, 9/00, 9/26*
U.S. Cl. 424—333 **1 Claim**

1. A disinfectant composition consisting essentially of pentanedial 2.5% by weight, para nitro phenol 1.6% by weight, O-phenyl phenol 0.1% by weight, sodium n-decyl diphenyl ether disulphonate 0.25% by weight and the remainder water.

3,917,851

FERMENTED SOYA PROTEIN

Michel Arnaud, and David Robert Farr, both of La Tour-de-Peilz, Switzerland, assignors to Societe d'Assistance Technique Pour Produits Nestle S.A., Lausanne, Switzerland

Filed May 24, 1974, Ser. No. 473,206
Claims priority, application Switzerland, May 28, 1973, 7635/73
Int. Cl.² A23J *1/14;* **A23L** *1/204*
U.S. Cl. 426—46 **6 Claims**

1. A process for preparing a fermented soya protein material, in which a substrate comprising a substantial proportion of soya proteins and having a fat content not exceeding 2% by weight is fermented in an aqueous medium with a mould of the genus Rhizopus, and a fermented material is recovered from the medium.

3,917,852

HIGH PROTEIN CITRUS FOOD PRODUCTS

Matthew D. Maraulja, Lakeland; John A. Attaway, and Cedric D. Atkins, both of Winter Haven, all of Fla., assignors to State of Florida Department of Citrus, Lakeland, Fla.

Division of Ser. No. 328,073, Jan. 30, 1973, Pat. No. 3,862,342, which is a continuation-in-part of Ser. No. 14,672, Feb. 26, 1970, abandoned. This application June 13, 1974, Ser. No. 479,159
Int. Cl.² A23L *2/06*
U.S. Cl. 426—48 **17 Claims**

1. A process for preparing a high protein citrus food product which comprises forming a mixture by combining about 1 to 6 weight percent of glycoprotein material which is soluble at a pH of about 2–4, about 0.1 to 1.0 weight percent of a soluble food stabilizer, and 0.5 to 3.0 weight percent starch in the presence of sufficient water to solubilize and partially hydrolyze said starch, heating the mixture at a temperature of about 210°–260° for about 10–15 minutes, to effect said solubilization and hydrolysis and adding at least 50% based on the total weight of the product of single strength citrus juice or the equivalent thereof in citrus solids.

3,917,853

PRODUCTION OF EXTRACTS FROM CELLS

Roderick Norman Greenshields, Birmingham, England, assignor to Greenshields Inventions Limited, Birmingham, England

Continuation-in-part of Ser. No. 137,654, April 26, 1971, abandoned. This application Oct. 10, 1973, Ser. No. 405,121

Claims priority, application United Kingdom, May 22, 1973, 24445/73

Int. Cl.[2] A23L *1/28*

U.S. Cl. 426—60 9 Claims

1. A process for making an extract from Penicillium mould which is at least substantially free from spores, which process comprises the steps of causing lysis under acid conditions of the constituents cells of the mould to occur to an extent such that the constituent polymers thereof are at least largely broken down to their component monomers, separating the resultant extract from gross solids such as cell debris and any undigesged cell material, rendering the separated extract non-acidic whereby phenyl acetic acid present is caused to form a precipitate, and separating the precipitate from the extract.

3,917,854

CHEESE EXTENDER

Robert L. Kasik, Berwyn, and Marvin A. Peterson, Park Ridge, both of Ill., assignors to Beatrice Foods Company, Chicago, Ill.

Filed Mar. 27, 1974, Ser. No. 455,510

Int. Cl.[2] A23C *19/12*

U.S. Cl. 426—573 22 Claims

1. A cheese extender composition comprising a congealed mixture of: essentially magnesium neutralized casein or potassium neutralized casein or a mixture of magnesium and potassium neutralized casein; a fat having a melting point of 130°F. or less; and water wherein the weight ratio of the neutralized casein to fat is from 1:2 to 2:1 and the weight ratio of water to the combination of neutralized casein and fat is from 1:2 to 3:1, whereby the composition exhibits the stringy characteristic, texture, mouth-feel and blandness similar to that of natural mozarella cheese.

3,917,855

EDIBLE COLLAGEN CASING COATED WITH AN EDIBLE POWDER AND METHOD OF PREPARING SAME

Noel L. Burke, Danville, Ill., assignor to Tee-Pak, Inc., Chicago, Ill.

Filed Mar. 12, 1974, Ser. No. 450,526

Int. Cl.[2] A23L *1/31*

U.S. Cl. 426—92 8 Claims

1. An edible collagen sausage casing having distributed over its external surface an effective proportion of an edible, substantially spherical, non-hygroscopic, non-toxic powder having a particle size of from about 0.5 – 35 microns, in the amount of 0.00015 – 0.015 mg./mg. casing, for substantially enhancing the slidability and lubricity of the casing to permit sausages processed therein to slide and roll against themselves.

3,917,856

REFRIGERATED CORN BREAD DOUGH

Carl Y. Wong, and William L. Murphy, both of Minneapolis, Minn., assignors to The Pillsbury Company, Minneapolis, Minn.

Filed Dec. 5, 1973, Ser. No. 422,043

Int. Cl. A21d *8/02*, *13/04*

U.S. Cl. 426—94 17 Claims

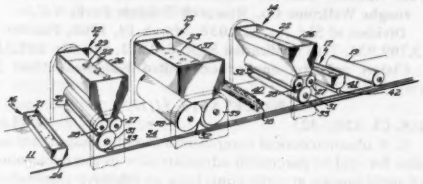
1. Fresh corn bread dough having a top and bottom layer of a first dough and an inner layer of a second dough; said first dough comprising from 10% to 30% by weight of said corn bread dough and said second dough comprising from 70% to 90% by weight of said corn bread dough;

said first dough being substantially undeveloped having a minimum Farinograph value of from 200 to 550 BU and a time-to-peak development of at least 15 minutes, and comprising flour, shortening and water; and,

said second dough being substantially undevelopable and comprising flour, cornmeal, shortening and water.

8. A process for preparing a layered dough sheet suitable for cutting into dough pieces and packing in refrigerated dough containers comprising the steps of:

a. extruding a bottom layer of a substantially undeveloped first dough in a thickness of from one-sixteenth inch to one-fourth inch on a conveying means; said first dough having a minimum Farinograph value of from 200 to 550 BU and a time-to-peak development of from 15 to 50 minutes;



b. extruding an inner layer of a substantially undevelopable second dough in a thickness of from one-half inch and 2 inches on said botton layer; said second dough after mixing exhibiting essentially no differential between its minimum Farinograph value and its maximum Farinograph value in 15 minutes Farinograph time and requiring a work of extrusion of from 200 to 850 inch-pounds when said second dough, at about 60° F., is extruded through a ⅜-inch orifice at the constant rate of 5 inches per minute;

c. extruding a top layer of a substantially undeveloped first dough in a thickness of from one-sixteenth inch to one-fourth inch on said inner layer; said dough forming said top layer having a minimum Farinograph value of from 200 to 550 BU and a time-to-peak development of from 15 to 50 minutes; and,

d. bonding the layers together.

3,917,857

DEHYDRATED READY MIX TABOULY SALAD

Edmond Abdo Slyman, Bristow, Okla., assignor to Slymans Lebanese Foods, Mfg. Co., Inc., Bristow, Okla.

Continuation of Ser. No. 188,528, Oct. 12, 1971, abandoned. This application Sept. 19, 1973, Ser. No. 398,675

Int. Cl.[2] A23L *1/212*

U.S. Cl. 426—106 6 Claims

1. A Tabouly salad mix in dehydrated form consisting essentially of, on a weight basis, about

2.4 to 4.4% citric acid,
3.6 to 6.6% salt,
0.5 to 0.9% black pepper,
0.16 to 0.20% mint,
0.6 to 1% red pepper,
0.6 to 1% green pepper,
10.6 to 13% onion,
2.3 to 5.3% parsley, and
73 to 76% cracked wheat,

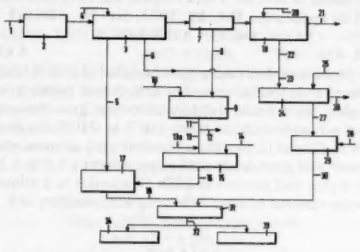
said mix adapted to be mixed with water and oil to form a Tabouly salad which is ready to be consumed no later than about two hours after said mixing.

3,917,858

AGGLOMERATION OF INSTANT POWDERS

Jaap Willem Bos, Joure, Netherlands, assignor to D.E.J. International Research Company N.V., Keulsekade, Netherlands

Filed Dec. 13, 1972, Ser. No. 314,751
Int. Cl.[2] A23F *1/06*; B01J *2/12*
U.S. Cl. 426—594 6 Claims



1. A process for the agglomeration of flavored water-soluble foodstuff powders comprising:

a. applying to the powder a finely divided emulsion of water and a water immiscible non-volatile edible and organoleptically acceptable oil in which aromatizing and soluble solid flavoring compounds are selectively dissolved,

b. agglomerating the particles of the soluble powder of step a to form porous agglomerates by keeping the powder in a state of thorough agitation while said finely divided emulsion is being applied.

3,917,859

EDIBLE OIL IN WATER IN OIL EMULSION

Kimio Terada; Satoshi Fujita; Hiroshige Kohno, and Hiromu Sugiyama, all of Tokyo, Japan, assignors to Asahi Denka Kogyo Kabushiki Kaisha, Japan

Filed July 19, 1973, Ser. No. 380,733
Claims priority, application Japan, July 21, 1972, 47-72493
Int. Cl. A23d *5/00*
U.S. Cl. 426—602 6 Claims

1. An edible emulsion comprising about 20–80% by weight of a continuous oil phase and about 20–80% by weight of a dispersed phase which is itself a stabilized oil-in-water dispersion comprising fat having a Solid Content Index at 0°C of not more than 50, in an amount of about 10–40% by weight of said emulsion and an aqueous phase, in an amount of about 10–40% by weight of said emulsion, containing (a) water-soluble protein, in an amount of about 0.05–1.0% by weight of said emulsion, said emulsion containing (b) a sucrose fatty acid ester having an HLB value of at least 10, in an amount of about 0.1–5.0% by weight of said emulsion, the weight proportion of (a) to (b) ranging from about 1 : 1 to about 1 : 5.

3,917,860

COOKED TEXTURED POULTRY PRODUCT AND METHOD FOR PREPARING SAME

James L. Ayres, Stone Mountain; Jeffery D. Peterson, Decatur, and Robert C. Steele, Conyers, all of Ga., assignors to Gold Kist Inc., Atlanta, Ga.

Filed Nov. 29, 1973, Ser. No. 420,230
Int. Cl.[2] A23J *3/00*; A23L *1/31*
U.S. Cl. 426—644 11 Claims

1. A method for preparing a poultry food product which comprises:

a. blending 65–75 parts of raw, comminuted poultry with 35–25 parts of comminuted, hydrated textured vegetable protein having a particle size of about 0.03–0.20 inches in diameter, the hydrated textured vegetable protein being derived from one part water and one part of unhydrated textured vegetable protein;

b. cooking the resultant mixture in (a) by contacting it at about 170°–212°F with a cooking broth, wherein said cooking broth is water, salt water, beef bouillon, or beef stock until the internal temperature of the mixture is about 170°F; and

c. cooling the cooked product to provide a cooked, textured poultry product having the appearance of cooked ground beef which does not have a poultry flavor.

3,917,861

PROCESS FOR PRODUCING NUTRITIOUS FOOD

Paul E. Viera, Battle Creek, Mich.; Anthony Benincasa, Zanesville, Ohio; Paul D. Halladay, Bondfield, Ill., and Diane J. LaTour, Danbury, Conn., assignors to General Foods Corporation, White Plains, N.Y.

Filed Oct. 24, 1973, Ser. No. 409,214
Int. Cl.[2] A23G *3/00*
U.S. Cl. 426—274 10 Claims

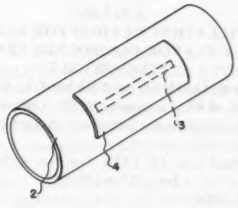
1. Method of forming a layer of ready-to-eat nutritious food having a cereal-fat mixture wherein the cereal particles bridge with one another and aggregate into a porous structure wherein void spaces are defined by the faces of the cereal particles and the fat which comprises placing successive portions of said mixture onto a moving elongated endless belt having a substantially planar upper reach, causing said mixture to advance on said belt toward a gap in a compacting zone between said belt and a second moving elongated endless belt having a substantially planar lower reach, the planes of said upper and lower reaches intersecting at an acute angle and the upper reach being spaced sufficiently proximate the mixture to have the charge initially contacted by the second belt prior to the mixture entering said gap, and gradually compacting each successive charge between the belts by causing said upper and lower belt reaches to move synchronously and passing the compacted mixture through said gap.

3,917,862

METHOD FOR PATCHING EDIBLE ARTIFICIAL COLLAGEN SAUSAGE CASINGS

Douglas J. Bridgeford, Champaign, Ill., assignor to Tee-Pak, Inc., Chicago, Ill.

Filed Apr. 8, 1974, Ser. No. 458,724
Int. Cl.[2] A23L *1/31*
U.S. Cl. 426—274 7 Claims



1. A method for producing edible artificial sausage casings of collagen comprising slitting or perforating said casings while in the gel state on an intermittent basis for removal of accumulated fluids in such casings, patching with an adhesive consisting of 50–350 Bloom gelatin to provide an air tight seal and then inflating for drying.

3,917,863

METHOD FOR FORMING AN ANNULAR FOOD RING

Harold B. Kaufman, Jr., New York; Howard Roth, Bronx, and John P. McCarthy, College Point, L.I., all of N.Y., assignors to DCA Food Industries Inc., New York, N.Y.

Division of Ser. No. 239,078, March 29, 1972, Pat. No. 3,807,919. This application Oct. 11, 1973, Ser. No. 405,468

Int. Cl.[2] A21D *13/00*

U.S. Cl. 426—283 9 Claims

1. A method for forming an annular food ring having an internal filling comprising the steps of partially forming the elemental annular shape of said annular food ring which partially formed elemental shape is substantially symmetrical in relation to a medial plane thereof, radially and outwardly introducing a predetermined quantity of filling into said partially formed annular shape which quantity of filling is substantially symmetrical in relation to the partially formed annular shape and the medial plane thereof while continuously forming said annular food ring and after introducing said predetermined quantity of said filling into said elemental annular shape discontinuing the introduction of said filling and continuously completing forming said food ring.

3,917,864

USE OF PROSTAGLANDINS E AND F FOR INDUCTION OF LABOR

Sultanali M. M. Karim, 3 Ekodo Ave., Kampala, Uganda

Continuation of Ser. No. 331,626, Feb. 12, 1973, abandoned, which is a continuation of Ser. No. 151,847, June 10, 1971, abandoned, which is a continuation-in-part of Ser. No. 846,223, July 30, 1969, abandoned. This application June 20, 1974, Ser. No. 481,101

Int. Cl.[2] A61K *31/19, 31/215*

U.S. Cl. 424—305 16 Claims

1. A method of inducing labor and delivery in a gestating mammal at or near term which consists essentially of administering systemically to a said mammal a pharmaceutical dosage unit form supplying an effective nontoxic amount for inducing labor and delivery of a prostaglandin selected from the group consisting of PGE_1, PGE_2, PGE_3, dihydro-PGE_1, $PGF_{1\alpha}$, $PGF_{2\alpha}$, $PGF_{2\alpha}$, $PGF_{3\alpha}$, dihydro-$PGF_{1\alpha}$, $PGF_{1\beta}$, $PGF_{2\beta}$, $PGF_{3\beta}$, dihydro-$PGF_{1\beta}$, pharmaceutically acceptable salts thereof, pharmaceutically acceptable acylates thereof wherein all hydroxy groups are acylated and the acyl radical is that of a lower alkanoic acid having 1 to 8 carbon atoms, inclusive and pharmaceutically acceptable alkyl esters thereof wherein the alkyl radical has 1 to 8 carbon atoms, inclusive.

3,917,865

CO-DISTILLATION METHOD FOR RECOVERING VOLATILE FLAVOR COMPOUNDS FROM CITRUS ESSENCE OILS

Philip E. Shaw, Lakeland, and Richard L. Coleman, Winter Haven, both of Fla., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jan. 28, 1974, Ser. No. 437,095

Int. Cl.[2] A23L *2/30*

U.S. Cl. 426—424 5 Claims

1. A process for obtaining a volatile, water-soluble concentrated flavor fraction from citrus essence oil, the process comprising:

a. forming an anhydrous solution of said essence oil and a low boiling solvent selected from the group consisting of acetone, methanol, ethanol and a nontoxic fluorinated hydrocarbon;

b. distilling the solution at about 2.7 to 3.3 millimeters of mercury and about 26° to 33° C.; and

c. recovering the most volatile about 2.2% by weight of the solution.

3,917,866

DECREASING THE RETROGRADED STARCH LEVEL AND INCREASING THE REHYDRATION RATE OF DEHYDRATED POTATO GRANULES

Edward Robert Purves, Forest Park, and Charles Oscar Snively, Green Township, Hamilton County, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 158,235, June 30, 1971, abandoned. This application Dec. 19, 1973, Ser. No. 426,161

Int. Cl.[2] A23B *4/04*

U.S. Cl. 426—457 5 Claims

1. A process of decreasing the retrograded starch level and increasing the rehydration rate of dehydrated potato granules comprising; mixing said dehydrated potato granules and hot water of a temperature of from 140°F to 210°F for from 10 minutes to 1 hour to provide a reconstituted mixture wherein the ratio of said granules to said water is from 1:1.5 to 1:5, and rapidly drying said mixture in from 10 seconds to 2 minutes to a moisture content of from 5% to 12% by weight.

3,917,867

PROCESS FOR PRODUCING A NATURAL ORANGE BASE BY DILUTION AND CENTRIFUGING

Cedric D. Atkins; John A. Attaway, both of Winter Haven, and Matthew D. Maraulja, Lakeland, all of Fla., assignors to State of Florida Department of Citrus, Lakeland, Fla.

Division of Ser. No. 323,216, Jan. 9, 1973, abandoned, which is a continuation-in-part of Ser. No. 867,886, Oct. 20, 1969. This application Nov. 16, 1973, Ser. No. 416,557

Int. Cl.[2] A23P *1/00*

U.S. Cl. 426—492 5 Claims

1. A process for producing a single-strength, highly colored, low viscosity orange base having the cloud, color and body of natural orange juice which comprises first diluting a single-strength orange juice with water to about 6° to 7° Brix and a viscosity of about one half of its original value, centrifuging the diluted juice to remove pulp down to a level of 0.3 to 0.6 percent by volume, other insoluble materials present down to a level of about 0.002 to 0.015 weight percent and pectins to about 0.03 to 0.05 weight percent, heat-treating the depulped juice to kill any microorganisms present, and obtaining a highly colored, single strength orange juice base with a light transmission which is not more than a value of 20 percent transmitted light over the percentage of light transmission for natural single strength orange juice.

3,917,868

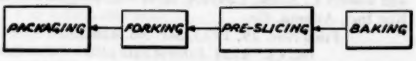
METHOD OF PRE-SLICING A MUFFIN FOR EASY SEPARATION

Hubert E. Tobey, Maywood; Alphonse M. Masiuk, Cresskill; John W. Hood, Rivervale, and Dee L. Irvin, Moonachie, all of N.J., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Continuation of Ser. No. 230,362, Feb. 29, 1972, abandoned, Division of Ser. No. 31,469, April 24, 1970, Pat. No. 3,669,165. This application Sept. 13, 1973, Ser. No. 397,040

Int. Cl.[2] A21D *6/00;* A23P *1/00*

U.S. Cl. 426—497 4 Claims



1. In preparing an English muffin for easy separation of the top portion of the muffin from the bottom portion, the method which facilitates continuous processing of the muffin without affecting its uniform shape during processing comprising in combination:

cutting the entire peripheral edge with a knife edge continuous peripheral out midway between the top and bottom portions of the muffin radially inward a predetermined

amount and leaving an uncut substantially constant diameter central zone; and

subsequently piercing the uncut central zone with forking elements passing through the peripheral cut, whereby the top and bottom central zone portions are approximately equal and rough textured when pulled apart.

3,917,869

3-FURYL THIOESTERS TO IMPART MEATY AROMA AND TASTE

William J. Evers, Atlantic Highlands; Howard H. Heinsohn, Jr., Hazlet; Bernard J. Mayers, Cliffwood Beach, and Elizabeth A. Karoll, Old Bridge, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 386,451, Aug. 7, 1973, Pat. No. 3,873,731. This application June 11, 1974, Ser. No. 478,369

The portion of the term of this patent subsequent to Aug. 7, 1990, has been disclaimed.

Int. Cl.² A23L *1/231*

U.S. Cl. 426—535 **4 Claims**

1. A process for altering the organoleptic properties of a foodstuff which comprises adding to said foodstuff from 0.02 up to 250 ppm of a 3-furyl thioester compound selected from the group consisting of:

2,5-dimethyl-3-thio(2-ethylbutyryl) furan; 2-methyl-3-thio(2-ethylbutyryl) furan; and 2,5-dimethyl-3-thio(2-methylbutyryl) furan

in order to impart to said foodstuff a meaty aroma and taste.

3,917,870

ENHANCING GRAPE FLAVOR WITH 2-PHENYL-3-CARBOETHOXYFURAN AND BIS (CYCLOHEXYL) DISULFIDE

Gary Slangan, Toms River; Alan O. Pittet, Atlantic Highlands; Christopher Giacino, Califon; Denis E. Hruza, Sr., Brick Town, all of N.J., and Edward J. Shuster, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 401,665, Sept. 28, 1973, abandoned. This application Oct. 29, 1974, Ser. No. 518,818

Int. Cl.² A23L *1/235*

U.S. Cl. 426—535 **3 Claims**

1. The process of altering the flavor properties of foodstuffs which comprises adding thereto a small but effective amount to enhance grape flavor of a mixture comprising 2-phenyl-3-carboethoxyfuran and bis (cyclohexyl) disulfide wherein the weight ratio of 2-phenyl-3-carboethoxyfuran: bis (cyclohexyl) disulfide is from 1.5: 0.02 up to 1.5:0.15.

3,917,871

FLAVORING AGENT

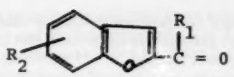
Max Winter, Geneva; Fritz Gautschi, Vaud; Ivon Flament; Max Stoll, both of Geneva, all of Switzerland, and Irving M. Goldman, Niantic, Conn., assignors to Firmenich & Cie, Geneva, Switzerland

Division of Ser. No. 243,866, April 13, 1972, which is a division of Ser. No. 70,560, Sept. 8, 1970, Pat. No. 3,702,253, which is a continuation of Ser. No. 543,069, April 18, 1966, abandoned, which is a continuation-in-part of Ser. No. 452,342, April 30, 1965, abandoned. This application June 24, 1974, Ser. No. 482,695

Int. Cl.² A23L *1/234*

U.S. Cl. 426—536 **16 Claims**

1. As a new composition of matter a soluble coffee material having added thereto a minor, but flavor-modifying amount of a compound selected from the group of compounds having the general formula:



wherein R_1 and R_2 are hydrogen or methyl.

3,917,872

FLAVORING AGENT

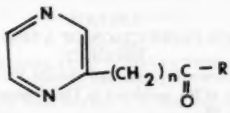
Max Winter, Geneva; Fritz Gautschi, Vaud; Ivon Flament; Max Stoll, both of Geneva, all of Switzerland, and Irving M. Goldman, Niantic, Conn., assignors to Firmenich & Cie, Geneva, Switzerland

Division of Ser. No. 243,866, April 13, 1972, which is a division of Ser. No. 70,560, Sept. 8, 1970, Pat. No. 3,702,253, Continuation of Ser. No. 543,069, April 18, 1966, abandoned, which is a continuation-in-part of Ser. No. 452,342, April 30, 1965, abandoned. This application June 24, 1974, Ser. No. 482,692

Int. Cl.² A23L *1/234*

U.S. Cl. 426—537 **16 Claims**

1. As a new composition of matter a soluble coffee material having added thereto a minor, but flavormodifying amount of a compound selected from the group of compounds having the general formula:



wherein R is hydrogen or an methyl group and *n* is 0 or 1.

3,917,873

EGG WHITE COMPOSITION HAVING IMPROVED WHIPPING PROPERTIES AND PROCESS FOR PRODUCING THE SAME

Namio Kuroda, and Shigeaki Mogi, both of Tokyo, Japan, assignors to Q. P. Corporation & Teijin Limited, Tokyo, Japan

Filed Feb. 14, 1974, Ser. No. 442,656

Claims priority, application Japan, Feb. 15, 1973, 48-17907

Int. Cl.² A23J *3/02;* **A23L** *1/32*

U.S. Cl. 426—568 **11 Claims**

8. An egg white composition having improved whipping properties comprising egg whites and from about 0.10% to about 2.5% by weight of cyclodextrin, based on the content of raw egg whites.

3,917,874

NON-HYGROSCOPIC, WATER-SOLUBLE FONDANT AND GLAZE COMPOSITION AND PROCESS FOR PREPARING THE SAME

Michael A. Sands, Hackensack, N.J., and Santino Paul Marino, Tarrytown, N.Y., assignors to CPC International Inc., Englewood Cliffs, N.J.

Division of Ser. No. 397,189, Sept. 13, 1973, Pat. No. 3,874,924. This application Oct. 10, 1974, Ser. No. 513,911

Int. Cl.² A23G *3/00*

U.S. Cl. 426—572 **10 Claims**

1. A process for preparing an icing or glaze formulation comprising, mixing

a. a dry fondant, comprising a copulverized, non-hygroscopic, free-flowing, water-soluble sugar composition comprising a white sugar component copulverized with a "pulverizing aid" in the form of a watersoluble maltodextrin having a measurable dextrose equivalent value not substantially above about 20, said "pulverizing aid" ranging from about 5 percent to about 20 percent by weight

of said sugar composition, said sugar composition having an average particle size range such that at least about 95 percent passes through a 325 mesh screen, said sugar composition having a ratio of weight average particle size to number average particle size of less than about 2; with

b. water, in an amount sufficient to dissolve said sugar composition to thereby obtain said icing or glaze formulation.

3,917,875

DESSERT COMPOSITION

David Stirling Gardiner, Tweedmouth, England, assignor to General Foods Limited, Banbury, England

Filed May 2, 1974, Ser. No. 466,584

Int. Cl.[2] A23L *1/04*

U.S. Cl. 426—573 **10 Claims**

1. A powdered dessert composition suitable for mixing with milk to obtain an acidic dessert consisting essentially of 5.0 to 20.0 percent of a cold water-soluble gelatin, 0.2 to 5.0 percent of a stabilizer, 5.0 to 25.0% of a pregelatinized starch, 2.0 to 7.0 percent of a food acid, 40.0 to 75.0 percent of a sweetening agent, from 0.0 to 25.0 percent yogurt powder, from 0.0 to 10.0 percent of an emulsifier and from 0.0 to an effective amount of color and flavoring ingredients; all percentages being by weight of the powdered dessert composition.

3,917,876

PROCESS FOR PRODUCTION OF A SIMULATED MEAT PRODUCT

Charles C. Harwood, Elgin, and Donald W. Quass, Downers Grove, both of Ill., assignors to The Quaker Oats Company, Barrington, Ill.

Continuation-in-part of Ser. Nos. 274,162, July 24, 1972, abandoned, Ser. No. 274,163, July 24, 1972, abandoned, Ser. No. 274,164, July 24, 1972, abandoned, and Ser. No. 274,165, July 24, 1972, abandoned. This application June 3, 1974, Ser. No. 475,756

Int. Cl.[2] A23J *3/00*

U.S. Cl. 426—585 **29 Claims**

15. A process of preparing a puffed food product which comprises subjecting moist protein material selected from the group consisting of oil seed vegetable protein, casein, caseinate salts, gelatin, microbiological protein, egg white, muscle protein, keratins, lactalbumin, and blood and comprising at least 30 percent by weight protein in the presence of sufficient water and under physical conditions sufficient to form a moisture-containing translucent to glassy product in a plastic condition, partly drying said translucent to glassy product to reduce its moisture content and puffing said partly dried product by placing the extrudate in a confined space; subjecting the extrudate in a confined space to a temperature above 212°F. for a time of from 5 to 100 seconds and a pressure of from 100 to 250 psi; and instantly releasing the pressure within 2 seconds on the extrudate causing the extrudate to puff and resemble meat;

said process further including admixing from about ½ to about 3 percent by weight of a lubricating substance selected from the group consisting of edible fats and oils, edible fatty acids, edible stearates, edible polylactic acid esters of fatty acids and oil bearing cereals or grains with the moist protein material.

3,917,877

PROCESS FOR PRODUCING A LIQUID CASEIN SUBSTITUTE

Surinder Kumar, Buffalo Grove, and Kolar S. Ramachandran, Palatine, both of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed June 12, 1974, Ser. No. 478,751

Int. Cl.[2] A23J *3/00, 3/02*

U.S. Cl. 426—656 **8 Claims**

1. A process for producing a modified vegetable protein having thermoplastic and forming properties similar to casein and caseinate salts, said process comprising:

A. making an aqueous slurry of a vegetable protein material containing at least about 50 percent by weight protein selected from the group consisting of oat protein and oil seed vegetable protein, said slurry having a solids content of from about 3 percent to about 16 percent by weight; at least about 50 percent by weight protein;

B. adjusting the pH of the aqueous slurry to a pH of from above 7.0 to about 10.5 by addition thereto of an alkali metal carbonate;

C. heating the aqueous slurry to a tmperature of from 280°F. to 370°F. for from 2½ to 5 minutes to react the alkali metal carbonate with the protein; and

D. neutralizing the slurry to a pH of from 6.6 to 7.0 by addition thereto of an edible acid.

3,917,878

SIMULATED CASEIN FROM PROTEINACEOUS MIXTURES

Surinder Kumar, Buffalo Grove, and Kolar S. Ramachandran, Palatine, both of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed June 12, 1974, Ser. No. 478,777

Int. Cl.[2] A23J *3/00, 3/02*

U.S. Cl. 426—656 **8 Claims**

1. A process for producing a proteinaceous mixture of modified vegetable protein and unmodified protein, said mixture having thermoplastic and forming properties similar to casein and caseinate salts, said process comprising:

A. making an aqueous slurry of a vegetable protein material containing at least about 50 percent by weight protein selected from the group consisting of oat protein and oil seed vegetable protein, said slurry having a solids content of from about 3 percent to about 16 percent by weight;

B. adjusting the pH of the aqueous slurry to a pH of from above 7.0 to about 10.5 by addition thereto of an alkali metal carbonate;

C. heating the aqueous slurry to a temperature of from 280°F. to 370°F. for from 2½ to 5 minutes to react the alkali metal carbonate with the protein;

D. neutralizing the slurry to a pH of from 6.6 to 7.0 by addition thereto of an edible acid;

E. drying the neutralized slurry to remove a substantial portion of the water therein; and

F. admixing from 1–15 parts by weight of the substantially dried neutralized slurry with from 1–30 parts by weight proteinaceous material not having been modified by reaction with an alkali metal carbonate.

3,917,879

PROCESS FOR PRODUCING A MIXTURE HAVING THE THERMOPLASTIC PROPERTIES OF CASEIN

Surinder Kumar, Buffalo Grove, and Kolar S. Ramachandran, Palatine, both of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed June 12, 1974, Ser. No. 478,752

Int. Cl.[2] A23J *3/00, 3/02*

U.S. Cl. 426—656 **10 Claims**

1. A process for producing a proteinaceous mixture of modified vegetable protein and unmodified protein, said mixture having thermoplastic and forming properties similar to casein and caseinate salts, said process comprising:

A. making an aqueous slurry of a vegetable protein material containing at least about 50 percent by weight protein selected from the group consisting of oat protein and oil seed vegetable protein, said slurry having a solids content of from about 3 percent to about 16 percent by weight;

B. adjusting the pH of the aqueous slurry to a pH of from above 7.0 to about 10.5 by addition thereto of an alkali metal carbonate;

C. heating the aqueous slurry to a temperature of from 280°F. to 370°F. for from 2 ½ to 5 minutes to react the alkali metal carbonate with the protein;

D. neutralizing the slurry to a pH of from 6.6 to 7.0 by addition thereto of an edible acid; and

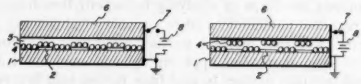
E. admixing from 1–15 parts by weight of the neutralized slurry with from 1–30 parts by weight proteinaceous material which has not been modified by treatment with an alkali metal carbonate.

3,917,880

ELECTROPHORETIC IMAGING SYSTEM

John B. Wells, Brighton, and Robert W. Gundlach, Victor, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed June 27, 1973, Ser. No. 374,216
Int. Cl.² G03G *13/10, 13/14, 15/10, 15/14*
U.S. Cl. 427—14 **15 Claims**



1. A method of forming images which comprises the steps of:

a. providing in imagewise configuration a layer of an injecting material on a conductive substrate to form an injecting master, said injecting material being capable of generating and injecting charge carriers in response to electrical field alone;

b. providing a second electrode member;

c. providing a layer of a suspension of particles in an insulating liquid, wherein said particles have a surface having a bulk resistivity of at least about 10^5 ohm-cm; and

d. applying an electrical potential difference between said conductive substrate and said second electrode of magnitude sufficient to cause imagewise migration of particles as a result of charge carrier injection from said injecting material until an image is formed.

12. Apparatus for forming images which comprises:

a. a first conductive member having an imagewise layer of an injecting material on a surface, said injecting material being a material capable of generating and injecting charge carriers in response to electrical field alone, said surface being adapted to support a layer of a suspension of particles in an insulating carrier liquid;

b. a second conductive member;

c. means for moving said second conductive member into contact with suspension on said first conductive member, and

d. means for applying an electrical potential difference between said first conductive member and said second conductive member of sufficient magnitude to cause particle migration in said suspension in response to charge carrier injection from said imagewise layer of injecting material.

3,917,881

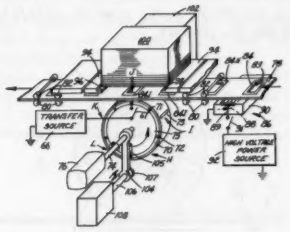
ELECTROSTATIC TONER TRANSFER

Philip J. Stevko, Euclid, Ohio, assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio

Filed Apr. 1, 1974, Ser. No. 457,071
Int. Cl.² G03G *13/16*
U.S. Cl. 427—24 **12 Claims**

1. A method of transferring a developed image of electrostatically charged developer particles from an insulating surface, which binds the developer particles in an electrostatic charge pattern, to a surface on a transfer member, said method comprising:

providing an apertured conductive sheet between the transfer member and the insulating surface and in engagement with the transfer surface but insulated from said insulating surface, and



connecting a source of electrical potential between the conductive sheet and the insulating surface to effect a charge flow between the transfer member proximate to the transfer surface and the insulating surface to reverse the direction of the net electrostatic force acting on the developer particles whereby the transfer occurs in the aperture area of the conductive sheet.

3,917,882

METHOD FOR APPLYING A DIELECTRIC GLASS TO A GLASS SUBSTRATE

Thomas A. Sherk, West Hurley, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 24, 1974, Ser. No. 482,678
Int. Cl.² B05D *5/12, 3/02*
U.S. Cl. 427—108 **8 Claims**

1. A method for applying a dielectric glass which contains no more than approximately 0.2% by weight AL_2O_3 to a glass substrate, comprising the following steps in the following sequence:

a. coating the dielectric onto the substrate;

b. reflowing the dielectric by heating it in an ambient of wet oxygen having a dew point within the range of approximately 25° to 90°C; and

c. soaking the dielectric by heating it in an ambient of dry gaseous oxygen having a dew point below approximately −40°C.

3,917,883

FLOCKED PRODUCTS AND THEIR MANUFACTURE

Frank M. Jepson, Morecambe, England, assignor to Nairn Coated Products, Limited, Lancaster, England

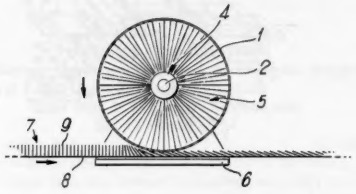
Filed Sept. 28, 1973, Ser. No. 401,790
Claims priority, application United Kingdom, Oct. 3, 1972, 45588/72
Int. Cl.² D03D *27/00;* **D04H** *11/00*
U.S. Cl. 427—198 **9 Claims**

1. A method of making a flocked product comprising a substrate having bonded to its surface a layer of flocked fibres which are substantially linear and which, in different parts of the surface, have different predominant non-perpendicular orientations, said method comprising the steps of:

a. applying fluid binder to the surface of the substrate;

b. flocking fibres onto the fluid binder;

c. laying the flocked fibres in a first part of the area of the surface in a predominant non-perpendicular direction while maintaining them substantially linear by rolling a stencil having perforations in the peripheral surface thereof over and in contact with the product with no relative movement at the zone of contact between the stencil and the product;



d. laying the fibres in a second part of the area of the surface in a different predominant non-perpendicular orientation while maintaining them substantially linear by movement of a separate movable orientation means contained in the stencil, the said second area being the area of the surface in contact with the perforations in the stencil; and

e. hardening the binder.

3,917,884

METHOD OF MAKING WOUND GRAPHITE CARBON BODY

Paul F. Jahn, Chelmsford, Mass., assignor to Fiber Materials, Inc., Biddeford, Maine

Filed Apr. 23, 1973, Ser. No. 353,500

Int. Cl.² B05D *3/02*

U.S. Cl. 427—228 **6 Claims**

1. Method for producing a carbon-carbon reinforced article comprising:

forming reinforcing, fibrous, carbon-containing material into a shape impregnated with a carbonaceous binder material;

curing said binder material; and

carbonizing said binder material in two heating steps in which the temperature of said article is kept substantially uniform throughout and comprising first heating the shape to raise the temperature of said shape at a first rate in the range of from about 60° to 100°C per hour to a temperature in the range of about 800° to 1000°C, and then increasing the rate of heating so as to raise the temperature of said shape at a second rate in the range of from about 100° to 300°C per hour to a temperature in the range of about 2200° to 2400°C, all at elevated pressure.

3,917,885

ELECTROLESS GOLD PLATING PROCESS

Kenneth D. Baker, Somerville, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Murray Hill, N.J.

Filed Apr. 26, 1974, Ser. No. 464,666

Int. Cl.² C23C *3/02*

U.S. Cl. 427—304 **20 Claims**

1. An electroless plating bath for autocatalytic deposition of Group IB metals upon a substrate comprising an aqueous solution of an imide complex of the Group IB metal to be plated, said imide complex of the Group IB metal to be plated including an imide selected from the group consisting of imides having the formula RNHCO, and cyclic imides having the formula RCONHCO, wherein R is selected from the group consisting of alkylene, substituted alkylene, arylene, and substituted arylene, an alkali metal cyanide in an amount ranging from about 2 to 20 grams per liter, sufficient to stabilize said bath, and a reducing agent selected from the group consisting of water soluble alkali metal borohydrides, water soluble amine boranes and formaldehyde, said bath maintained at a pH of from about 11 to 14.

3,917,886

METHODS OF PRODUCING A POLYMER FILM ON A FIBRE

Manfred Schuierer, Erbach, Odenwald, Germany, assignor to Bruckner Apparatebau GmbH, Erbach, Odenwald, Germany

Filed Feb. 20, 1973, Ser. No. 333,670

Claims priority, application Germany, Feb. 18, 1972, 2207687

Int. Cl.² B05D *3/10*

U.S. Cl. 427—342 **5 Claims**

1. A two-stage method for producing a polymer film on the surface of a fibre capable of absorbing a polar substance, comprising the steps of applying hexamethylenediamine as a first reaction partner to a fibre capable of absorbing a polar material, said first reaction partner emulsified in a non-polar solvent, and thereafter applying sebacyl acid chloride as a second reaction partner to said fibre having said first reaction partner absorbed thereon, and causing said first and second reaction partners to react in situ on said fibre to provide a polymer film.

3,917,887

PROCESS FOR DYEING OXIDE LAYERS ON ALUMINUM AND ALUMINUM ALLOYS

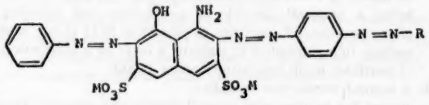
Frank P. Stiller, Randolph Township, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed Jan. 24, 1974, Ser. No. 436,130

Int. Cl.² C25D *11/24;* **C23F** *5/04;* **C09B** *35/46*

U.S. Cl. 427—343 **35 Claims**

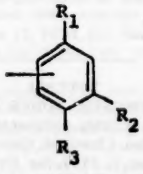
1. A process for dyeing an oxide layer on aluminum or an aluminum alloy having an aluminum content of at least 80% comprising applying to said aluminum or an aluminum alloy having an oxide layer thereon a dye of the formula



or a mixture thereof,

wherein

R is (a)

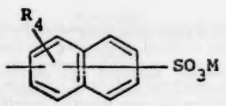


wherein

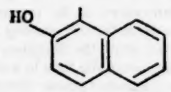
R_1 is amino, anilino or toluidino,

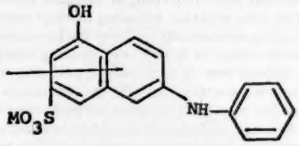
R_2 is hydroxy or amino, and

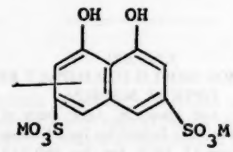
R_3 is hydrogen, nitro, alkyl or $—SO_3M$, with the proviso that R_3 must be hydrogen unless both R_1 and R_2 are amino.

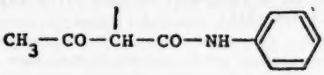


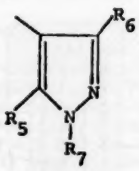
wherein R_4 is hydroxy, amino, anilino or toluidino,

(c) 

(d) 

(e) 

(f) 

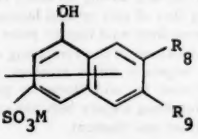
(g) 

wherein

R_5 is hydroxy, alkylsulfonyloxy, phenylsulfonyloxy, amino, alkylsulfonylamino or phenylsulfonylamino,

R_6 is alkyl, alkoxy, acetyl, carboxy or carbamoyl, and

R_7 is hydrogen, alkylcarbonyl, benzoyl, alkyl, substituted alkyl having 1 or 2 substituents wherein each substituent is independently alkoxy, chloro, cyano or hydroxy, phenyl, substituted phenyl having 1 to 3 substituents wherein each substituent is independently halo, alkyl, alkoxy, nitro, cyano, amino or $-SO_3M$, naphthyl or substituted naphthyl having 1 or 2 substituents wherein each substituent is independently $-SO_3M$, or

(h) 

wherein

R_8 is hydrogen or amino, and

R_9 is hydrogen or amino, with the proviso that one of R_8 and R_9 is amino and the other is hydrogen, and

each M is independently hydrogen or an equivalent of a non-chromophoric cation,

wherein

each alkyl, alkoxy, alkylsulfonyloxy, alkylsulfonylamino, and alkyl chain of substituted alkyl and alkylcarbonyl independently has 1 to 6 carbon atoms.

35. A process according to claim **1** wherein said aluminum or aluminum alloy having an oxide layer thereon is anodized aluminum or aluminum alloy and wherein said anodized aluminum or aluminum alloy is sealed subsequent to application of dye.

3,917,888

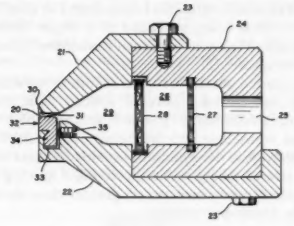
COATING CONTROL

Daniel J. Beam, Pittsburgh, and James J. Butler, Jr., Bethel Park, both of Pa., assignors to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

Filed Nov. 12, 1969, Ser. No. 875,858

Int. Cl.[2] **B05D** *1/18*

U.S. Cl. 427—433 **4 Claims**



1. A process for controlling the coating of a substrate comprising, depositing a coating material as a liquid on the substrate, moving the substrate in a longitudinal path past a nozzle having an elongated opening which extends at least across the width of the substrate, said nozzle having two nozzle lips and a tapered insert member releasably supported by one of the nozzle lips, one of said lips and said insert member forming said elongated opening, said opening tapering substantially uniformly from its ends to substantially its midpoint, forcing a gaseous fluid through said opening and directing the gaseous fluid to the substrate to cause said gaseous fluid to impinge onto the substrate whereby to establish a desired coating thickness profile and weight on the substrate, and in response to changes in variables affecting the coating thickness profile and weight, changing the taper of the nozzle opening by withdrawing said insert member while simultaneously inserting an insert member having a different taper to thereby control coating weight.

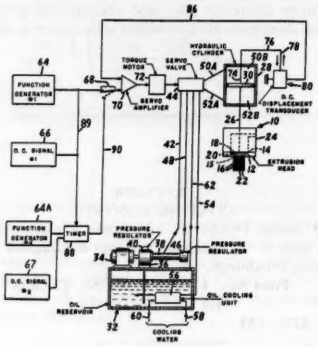
3,917,889
EXTRUDED TUBULAR NET PRODUCTS

Bernard J. Gaffney, Stillwater, and Ronald L. Larsen, Minneapolis, both of Minn., assignors to Conwed Corporation, St. Paul, Minn.

Continuation of Ser. No. 189,906, Oct. 18, 1971, abandoned, which is a division of Ser. No. 877,686, Nov. 18, 1969, abandoned. This application July 2, 1973, Ser. No. 375,671

Int. Cl.[2] **B29C** *19/00;* **D04H** *3/16*

U.S. Cl. 428—36 **2 Claims**



1. An extruded plastic net-like seamless tubular structure comprising substantially parallel spaced solid longitudinal strands and substantially parallel spaced solid transverse strands said transverse strands being extruded integral with and normal to said longitudinal strands and at least one of said transverse strands being extruded of a larger cross sectional dimension than the cross sectional dimension of other of the transverse strands.

2. An extruded plastic net-like seamless tubular structure comprising substantially parallel spaced solid longitudinal strands and substantially parallel spaced solid transverse strands said transverse strands being extruded integral with and normal to said longitudinal strands at least one of said transverse strands being extruded having a spacing between it and an adjacent transverse strand greater than the spacing of other of the transverse strands.

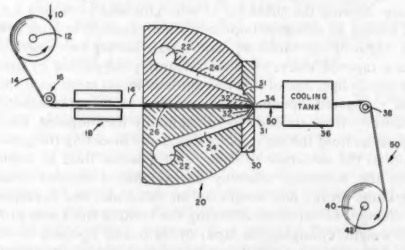
3,917,890
COMPOSITE TAPE AND METHOD OF FORMING THE SAME

Sidney Levy, 145 W. Cuthbert Blvd., Oaklyn, N.J. 08107

Continuation-in-part of Ser. No. 887,990, Dec. 24, 1969, abandoned. This application Mar. 14, 1973, Ser. No. 341,238

Int. Cl.[2] **D04B** *1/00;* **B32B** *17/02;* **D03D** *17/00*

U.S. Cl. 428—228 **19 Claims**



1. A method of forming a composite tape having a foraminous fiberglass core, comprising the steps of treating a continuous strip of foraminous core material with adhesion promoting and stiffening material; preheating the continuous strip of the foraminous core material; passing the core material through an extrusion head and die of a resin material extrusion device and extruding the resin material therethrough; applying a coating of resin material to each side of the fiberglass core material during the course of passage through the extrusion head and prior to its emergence from the extrusion die; maintaining the resin material at substantially the extrusion pressure during passage of the core material through the die to force the same into the interstices of the foraminous core material prior to emergence from the die opening to impart a uniform layer of resin material about the fiberglass core material; and cooling the resulting composite tape to a temperature which substantially hardens the coated plastic ribbon material.

16. A composite tape comprising an elongate foraminous strip of fiberglass core material; a coating of vinyl polymer plastic material having substantially uniform thickness enclosing said core material along its length, said coating comprising two opposing ribbons one on each side of said strip at least portions of which penetrate and fill the interstices to form a unitary bonded mass; and an adhesion promoting and stiffening agent between said strip of fiberglass and said vinyl plastic material which promotes the bonding properties between said strip and plastic material and improves the stiffness and handling ease of the tape.

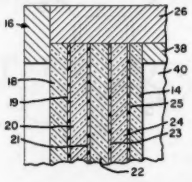
3,917,891
FRAGMENTATION SHIELD FOR IMPACT RESISTING OPTICAL MEDIUM

William C. Cooke, and Albert H. Agett, both of Kingsport, Tenn., assignors to ASG Industries Inc., Kingsport, Tenn.

Filed Apr. 11, 1974, Ser. No. 460,013

Int. Cl.[2] **B32B** *3/06, 17/08;* **C03C** *27/10;* **F41H** *5/04*

U.S. Cl. 428—337 **17 Claims**

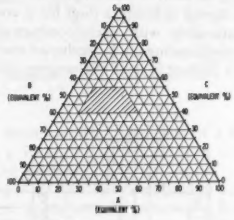


1. A barrier for use as a shield to prevent fragmentation of any one of the barrier medium and bullet resisting glass from becoming airborne upon impact along the path of movement of a projectile comprising a frame member, a lamination including a plurality of optical layers and interposed plastic material bonding layers, said plastic material bonding layers being significantly thinner in cross-section than any one of said optical layers and having an index of refraction substantially matching that of said optical layers, at least the optical layer furthermost from said impact point being of a thickness less than the thickness of the remaining optical layers of said lamination, a fragment shield element, said lamination and element supported by said frame in parallel relation, and means for maintaining a space between said furthermost layer of said lamination and element.

3,917,892
SOLDERABLE AND THERMOSTABLE INSULATED WIRES

Munetaka Kawaguchi, and Hirohiko Nakabayashi, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jan. 2, 1974, Ser. No. 430,128
Claims priority, application Japan, Dec. 29, 1972, 47-2321
Int. Cl.² H01B *3/30;* **C08G** *73/10*
U.S. Cl. 428—383 **21 Claims**



1. A solderable thermostable insulated wire comprising a conductor having a wire enamel coated and baked thereon, said wire enamel comprising the reaction product of (A) a dicarboxylic acid free of a 5-membered imide ring and/or a derivative thereof, (B) a dicarboxylic acid containing a 5-membered imide ring and/or a derivative thereof, (C) a trihydric or higher aliphatic polyhydric alcohol, and (D) a dihydric alcohol, the equivalent proportions of the said components (A), (B) and (C) being 10 to 40 equivalent % for said component (A), 20 to 50 equivalent % for said component (B), and 40 to 55 equivalent % for said component (C).

3,917,893
POLYAMIDE YARN

Robert Moore Marshall; Sung Kun Pak, both of Chester, and Kimon Constantine Dardoufas, Richmond, all of Va., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Feb. 4, 1974, Ser. No. 438,970
Int. Cl.² P02J *3/00;* **D01H** *13/30*
U.S. Cl. 428—395 **3 Claims**

1. A continuous filament polyamide yarn which is first coated with a first finish composition consisting essentially of 30 to 60 parts by weight of white mineral oil having a boiling point of between 265°C. and 330°C., 25 to 50 parts by weight of an ethoxylated phosphated oleyl alcohol, 2 to 10 parts by weight of a sulfonated succinic acid ester of oleyl alcohol, and 5 to 10 parts by weight of an oxidized polyethylene wax having an average molecular weight between about 1,000 and about 3,000 and containing 3 to 6 percent of oxygen by weight; then coated with a second finish composition consisting essentially of 60 to 70 parts by weight of an aqueous dispersion of colloidal silica containing about 25 to 50 weight percent silica in the form of a stable silica sol, and 30 to 40 parts by weight of a polyethylene glycol ester of a C_8–C_{18} aliphatic acid, said polyethylene glycol having a molecular weight of about 200 to 600, and the weight ratio of said silica to said polyethylene glycol ester being between 0.45 and 0.70; said yarn being coated with an effective amount of said first finish composition to provide a water-resistant oxidized polyethylene wax coating thereon of between 0.05 and about 2 percent by weight of the yarn, and said second finish composition being applied to the yarn in an amount sufficient to supply between about 0.1 percent and about 0.6 percent of silica based on the weight of the yarn, whereby processing of said yarn through coning operations is improved.

3,917,894
PROCESS FOR COATING REGENERATED CELLULOSE FILM AND THE COATED FILM

Harold R. Coleman, Danville, Ill., assignor to Tee-Pak, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 66,645, Aug. 24, 1970, Pat. No. 3,764,350, which is a continuation-in-part of Ser. Nos. 697,592, Jan. 15, 1968, Pat. No. 3,539,361, and Ser. No. 44,556, June 8, 1970, Pat. No. 3,695,904. This application Aug. 17, 1973, Ser. No. 389,307
The portion of the term of this patent subsequent to Oct. 9, 1990, has been disclaimed.
Int. Cl.² B32B *23/08;* **A22C** *13/00*
U.S. Cl. 428—414 **6 Claims**

1. A process for manufacturing resin-coated regenerated cellulose film, which comprises:

coating one surface of a gel cellulose film prior to drying with a first coating composition of an aqueous solution of a water-soluble epoxy thermosetting resin reaction product of an epihalohydrin and a polysecondary amine selected from the group consisting of polyamideamines and polyureaamines, said epoxy resin having an epoxy equivalent weight of at least about 100, drying the coated gel film to cure said coating and provide on the ultimately produced dried regenerated cellulose film a water-insoluble, crosslinked, surface coating,

applying over the crosslinked surface coating thus formed a thin coating of a second coating composition comprising a resin and liquid vehicle, and

heating the coated casing to dry and cure the second coating thereon to form an adherent film.

3,917,895
FLUORINATED POLYOLEFIN LAMINATES BONDED WITH AN ASPHALT-ATACTIC POLYPROPYLENE MIXTURE

David S. Bosniack, Baytown, Tex., assignor to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 245,389, April 19, 1972, abandoned. This application Sept. 14, 1973, Ser. No. 397,484
Int. Cl.² B32B *11/08, 11/04*
U.S. Cl. 428—421 **4 Claims**

1. An improved laminated article which comprises a supporting substrate, an at least partial coating on said substrate of a blend of from about 20 to about 80 weight percent of an asphalt having an ASTM Method D5-25 penetration value between about 20 and about 500 and an ASTM Method D36-36 softening point between about 25° and about 150°C. annd from about 20 to about 80 weight percent of atactic polypropylene, and a layer of fluorinated polyolefin bonded to said substrate by said blend of asphalt and atactic polypropylene.

3,917,896

INDUCTION MELTING FURNACE

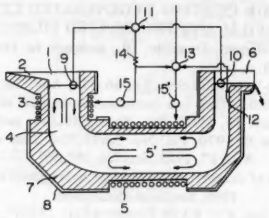
Ryuichi Nakagawa; Shiro Yoshimatsu, both of Tokyo; Akira Fukuzawa, Yokohama; Akira Sato, Omiya; Tatsuro Mitsui, Sagamihara; Takuya Ueda, Zushi, and Tsuyoshi Ozaki, Tokyo, all of Japan, assignors to National Research Institute For Metals, Tokyo, Japan

Division of Ser. Nos. 404,901, Oct. 10, 1973, and Ser. No. 484,153, June 28, 1974, which is a division of Ser. No. 404,901. This application Sept. 13, 1974, Ser. No. 505,664

Claims priority, application Japan, Nov. 11, 1972, 47-101125

Int. Cl.² H05B 5/16

U.S. Cl. 13—27 1 Claim



1. An induction melting furnace for melting a furnace charge, comprising:

a material charging section;

a main melting section equipped with a first induction coil for melting the furnace charge by induction heating;

a molten metal effluent section;

an auxiliary induction coil for promoting melting of the material by additional heating of the material and molten metal at the material charging section, said auxiliary coil including a change-over device supplying monophase alternating current to said coil to exert upwardly and downwardly directed forces on the material and molten metal in the material charging section by virtue of a pinch effect and said change-over device supplying upwardly and downwardly directed forces on the material and molten metal by virtue of a progressive magnetic field impressed thereon; and

a control system for controlling the flow rate of the molten metal effluent, wherein said system incorporates a device for detecting the flow rate of the molten metal effluent, a device for detecting the liquid level of the material charging section and means for regulating electric power supplied to the auxiliary induction coil and, further, wherein said regulating means is operated by signals from the flow rate detecting devices and the liquid level detecting device.

3,917,897

LOW TEMPERATURE CABLE SYSTEM AND METHOD FOR COOLING SAME

Ulrich Hildebrandt, Munich, Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed Oct. 22, 1974, Ser. No. 517,013

Claims priority, application Germany, Oct. 25, 1973, 2353536

Int. Cl.² H01B 7/34

U.S. Cl. 174—15 C 10 Claims

1. A method of cooling a lower-temperature cable system comprising three electrical conductors each surrounded by a radiation shield and having a respective duct for conducting a low-temperature coolant in cooling relationship with the respective conductor and a respective flow passage for conducting a low-temperature coolant for each radiation shield, said other system having a cooling plant for said coolant, said method comprising the steps of:

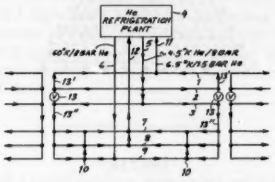
a. passing a first coolant from said plant through said ducts to cool said conductors;

b. returning a first part of the first coolant traversing said ducts directly to said plant;

c. passing a second coolant from said plant through at least a portion of said passages to cool said radiation shields and returning said second coolant in a stream to said plant; and

d. bypassing a second part of the first coolant to said stream of second coolant in mixture therewith prior to its return to said plant.

10. A low temperature cable system comprising a succession of cable lengths, each of said lengths having three electrical conductors, means defining a duct for a coolant in heat-exchanging relationship with each conductor, a radiation shield spacedly surrounding each conductor means defining a passageway for a coolant in heat-exchanging relationship with



each radiation shield; a cooling plant for each of said lengths for cooling the respective coolants; means for passing a first coolant from each of said plants into two of said ducts at a location intermediate the ends thereof; means for connecting one of said two ducts of each length to the other duct thereof at the opposite ends of the respective lengths for returning said first coolant through said other duct, means for connecting said other duct of each length to the respective plant for returning a first part of said first coolant directly thereto; means connecting the other of said two ducts to said passages at the ends thereof for feeding a second part of said first coolant thereto; means connecting said plant to one of the passages of the respective length at a location intermediate its ends by supplying a second coolant to said one of said passages; means connecting another of said passages to the respective plant at a location intermediate the ends of said length for returning said second coolant to said plant; and means interconnecting all of said passages of a respective length at locations on opposite sides of said intermediate locations and spaced inwardly from the ends thereof.

3,917,898

WATER-COOLED CABLE

Seijiro Iketani; Hiromi Fukuda, both of Kawasaki, and Iwao Shirai, Gifu, all of Japan, assignors to Showa Densen Denran Kabushiki Kaisha, Kawasaki, Japan

Continuation-in-part of Ser. No. 430,842, Jan. 4, 1974, which is a continuation of Ser. No. 300,085, Oct. 24, 1972. This application Dec. 11, 1974, Ser. No. 531,507

Claims priority, application Japan, Oct. 22, 1971, 46-98370[U]

Int. Cl.² H01B 7/34

U.S. Cl. 174—15 C 11 Claims

1. A water-cooled cable having a cross-sectional area of more than 1000 square milimeters, said cable comprising:

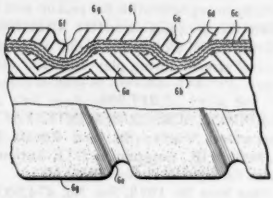
1. a stranded conductor and

2. a water-tight hose shielding said stranded conductor and forming a water passage between said stranded conductor

and said hose, said hose comprising, from outside to inside:

a. an outer shell composed on a wear-and heat-resistant material having a Young's modulus of between 0.18×100 kg/cm^2 and 0.30×100 kg/cm^2 and having a groove or grooves on its peripheral surface;

b. a reinforcing layer having corrugations therein corresponding to the groove or grooves on the periphery of said outer shell;



c. a soft inner member composed of a flexible material having a Young's modulus between 0.18×100kg/cm^2 and 0.30×100 kg/cm^2; and

d. a strong inner member composed of a flexible material having a Young's modulus between 0.25×100kg/cm^2 and 0.40×100 kg/cm^2,

said soft inner member being located in gaps between said strong inner layer and the corrugations in said reinforcing layer and said strong inner layer contacting said reinforcing layer at the corrugations.

3,917,899

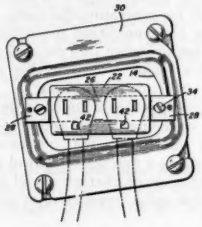
PLATE FOR ADJUSTABLY MOUNTING ELECTRICAL RECEPTACLE

Michael J. Oliver, 19741 NW. 7th Court, Miami, Fla. 33169

Division of Ser. No. 277,859, Aug. 4, 1972, abandoned, which is a division of Ser. No. 88,863, Nov. 12, 1970, Pat. No. 3,697,924. This application Oct. 12, 1973, Ser. No. 406,023

Int. Cl.^{2} H02G *3/12*

U.S. Cl. 174—57 **1 Claim**



1. A device for supporting an electrical receptacle having means for clampingly engaging an interior edge of an opening so as to electrically connect said clamping means to said interior edge, said device comprising:

a. a plate having a substantially flat rear surface with outer edges having means to secure the plate to an electrical outlet box;

b. a central raised portion on the front of the plate projecting outwardly therefrom with inwardly turned edges to define a second substantially flat surface generally parallel to the rear surface;

c. a generally rectangular shaped opening in said second flat surface having two substantially parallel long sides and two non-parallel short sides, the short sides being arcuately curved away from the center of the opening along their entire lengths to present said second flat surface in that area with an arcuately curved interior edge for engagement by said clamping means.

3,917,900

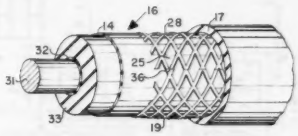
ELECTRIC CABLE WITH EXPANDED-METAL SHIELD AND METHOD OF MAKING

Edwin H. Arnaudin, Jr., Eden, N.C., assignor to The Anaconda Company, New York, N.Y.

Filed July 26, 1971, Ser. No. 166,293

Int. Cl.^{2} H01B *11/06*

U.S. Cl. 174—107 **8 Claims**



1. An electric cable comprising:

A. an elongated conductor,

B. a wall of insulation surrounding said conductor,

C. a layer of semiconducting polymeric composition surrounding said wall of insulation,

D. a flattened expanded-metal tape surrounding said layer,

E. a coating of polymeric adhesive material bonded to at least one surface of said tape, and bonding said tape to said layer.

3,917,901

CONDUCTOR WITH INSULATIVE LAYER COMPRISING WOOD PULP AND POLYOLEFIN FIBERS

Thomas Benjamin Jones, Gibson Island, Md., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 359,743, May 14, 1973, abandoned, which is a continuation of Ser. No. 921,427, Nov. 24, 1970, abandoned. This application July 26, 1974, Ser. No. 492,247

Int. Cl.^{2} H01B *3/48, 7/02*

U.S. Cl. 174—110 P **4 Claims**

1. A conductor having an insulative layer comprising from 10 to 40 parts by weight of wood pulp, from 80 to 35 parts by weight of polyolefin fibers and from 10 to 25 parts by weight of a binder, said polyolefin fibers being characterized by a denier size not substantially greater than 6.0 and a fiber length not substantially greater than ¾ inch.

3,917,902

TELEVISION RECEIVER WITH PATTERN GENERATOR

John Emery Olson, Harbert, Mich., assignor to Heath Company, Benton Harbor, Mich.

Filed July 17, 1974, Ser. No. 489,198

Int. Cl.^{2} H04M *5/24*

U.S. Cl. 178—6 **14 Claims**

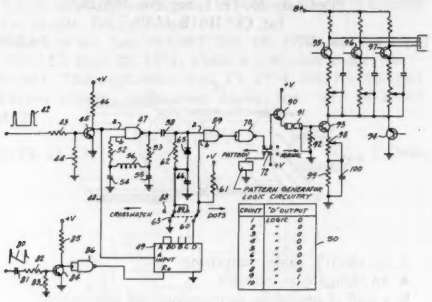
1. In a television receiver having a normal video circuit and an associated picture tube, a pattern generator for being coupled thereto comprising:

means for developing a first signal in synchronism with the electron beam scan of the picture tube for producing a generally parallel line display in a first direction,

means for developing a second signal in synchronism with the electron beam scan of the picture tube for producing a generally parallel line display in a second perpendicular direction,

gating means having a first function of continually coupling a pattern signal to the video circuit during the occurrence of either of said first and second signals,

means for switching the function of said gating means to couple a pattern signal to the video circuit only during the simultaneous occurrence of both said first and second signals, and



manual means for adding the pattern display to normal video display.

3,917,903

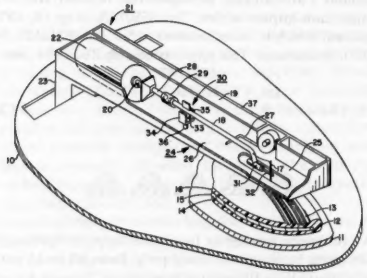
DETACHABLE PICKUP ARM MAGNETIC COUPLING

Byron Kent Taylor, and William Henry Carlin, both of Indianapolis, Ind., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 12, 1974, Ser. No. 522,822

Int. Cl.[2] H04N *5/76*

U.S. Cl. 178—6.6 R **4 Claims**



1. In a playback system for recovering prerecorded information from a spirally grooved disc record rotatably mounted on a turntable by a signal pickup when relative speed is established therebetween, wherein it is desirable that the signal pickup maintain a specified attitude with respect to the spiral groove during playback; the playback system including a pickup arm carrying the signal pickup, and a pickup arm supporting structure having means for imparting translatory motion to the signal pickup along the longitudinal axis of the pickup arm in a manner that opposes deviations of the relative speed from a predetermined speed; a detachable pickup arm magnetic coupling comprising:

means, fixedly secured to the translatory motion imparting means, for supporting a first magnetic coupling element of magnetizable material;

a coupler secured to an end of the pickup arm remote from the signal pickup and including a second magnetic coupling element of magnetizable material which is subject to releasable engagement with the first magnetic coupling element when the pickup arm magnetic coupling is in an assembled condition, wherein at least one of the first and the second magnetic coupling elements is permanently magnetized, and wherein the engagement of the first and the second magnetic coupling elements permits rigid transmission of the longitudinal motion of the translatory motion imparting means to the pickup arm via the coupler; and

guide means secured to the support means and the coupler, (1) for establishing a rotational orientation of the pickup arm during engagement of the coupling elements, and (2) for prohibiting any rotational motion of the pickup arm coupler in relation to the support member about, (a) a first axis substantially normal to, and (b) a second axis substantially in registry with, the pickup arm longitudinal axis when the coupling is in the assembled condition whereby the signal pickup maintains a specified attitude in the spiral groove during playback.

3,917,904

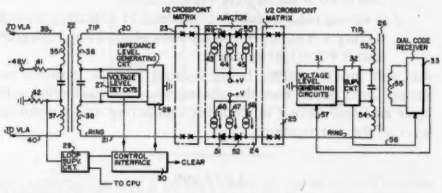
VIDEO TELEPHONE SUBSCRIBER INTERFACE CIRCUIT

Max S. Macrander, Warrenville, and Ronald F. Kowalik, Lombard, both of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed May 30, 1974, Ser. No. 474,503

Int. Cl.[2] H04M *11/08*

U.S. Cl. 179—2 TV **7 Claims**



1. In a telephone system of the type which provides for both audio or audio-video communication, wherein the system has an audio-video network including an audio crosspoint switching matrix for carrying the audio portion of the audio-video communication, the matrix having current sources for sustaining a transmission path pair between any two endpoints of the system, an audio network for carrying the audio communication and dial code means coupled to at least one end of the crosspoint matrix for generating dial codes, the dial codes for the audio-video communication including a unique set of characters, the improvement of a means for conditioning the system for either audio or audio-video communication in response to the dial codes comprising:

dial code receiving means coupled to the other end of said crosspoint switching matrix and responsive to the dial codes generated by the dial code means, said receiving means providing a first set of control signals in response to said unique set of characters and providing a second set of control signals responsive to any other set of dial characters;

voltage level generating means coupled to said receiving means and to said crosspoint matrix and responsive to said control signals for providing transmission path pair voltages having first and second relative voltage magnitudes in response to said first and second sets of control signals respectively; and

voltage detecting means coupled to the transmission path pair of the crosspoint matrix for detecting the relative voltage magnitudes on the transmission path pair and for providing first and second system conditioning signals responsive to said first and second relative voltage magnitudes respectively, wherein said transmission path voltages are either unequal corresponding to first relative current magnitudes in said transmission path caused by said voltage level generating means or said transmission path voltages are equal corresponding to second relative current magnitudes in said transmission path caused by said voltage level generating means, said first conditioning signal for activating said audio-video network and said

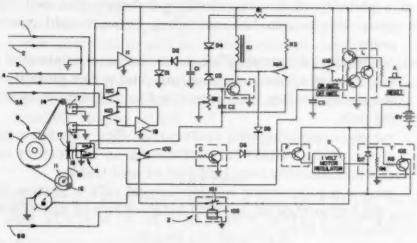
second conditioning signal for activating said audio network;

whereby, said audio-video network is selectively activated when said dial code means generates said unique set of characters and said audio network is selectively activated when said dial code means generates any other set of characters.

3,917,905
REMOTE INTERROGATOR DEVICE

Neal J. Buglewicz, 12 Empty Saddle Road, Rolling Hills Estates, Calif. 90274

Continuation-in-part of Ser. No. 278,759, Aug. 8, 1972, abandoned. This application Feb. 4, 1974, Ser. No. 439,292
Int. Cl.² H04M *1/64*
U.S. Cl. 179—6 E **8 Claims**



1. In combination with a telephone answering machine adapted to be operatively connected to a telephone line and having means to respond to incoming telephone calls, means for broadcasting a message to callers including a tone signal at the end of said broadcast message and means for recording messages from such callers for later replay,

a remote interrogator attachment operatively connected to said telephone line and said telephone answering machine, comprising:

an endless recirculating recording and broadcast tape loop, means responsive to said tone signal on said broadcast tape for driving said tape loop at recording-broadcast speed,

means connected to said telephone answering machine to simultaneously record on said tape loop a duplicate recording of messages recorded on said telephone answering machine,

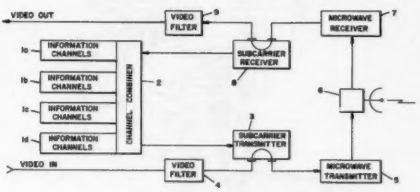
a latching switch operatively connected to said driving means and responsive to a coded signal injected into the telephone line by a caller from a remote telephone to take control of said telephone line and cause said driving means to move said tape rapidly forward to the beginning of the messages on said loop, and

switch means operative upon said tape loop reaching the beginning of messages thereon to change the speed of said tape loop to normal recording-broadcast whereby said messages will be over said telephone line to said remote caller, said switch means normally remaining operative to cause said tape loop to continue to run forwardly after all the messages thereon are broadcast to the remote caller until said tape loop reaches its beginning, and the recording of additional messages on said tape loop will erase the duplicate messages previously recorded thereon while leaving the original messages recorded on the telephone answering machine.

3,917,906
SYSTEM FOR MULTIPLEXING INFORMATION CHANNELS ADJACENT TO A VIDEO SPECTRUM

J. Walter Johnson, Walnut Creek, and Herbert H. Borchers, Concord, both of Calif., assignors to Coastcom, Inc., Concord, Calif.

Filed June 13, 1973, Ser. No. 369,481
Int. Cl.² H04J *1/08, 1/12*
U.S. Cl. 179—15 FD **7 Claims**



5. A method for recovering multiple channel information multiplexed with a video spectrum that includes sync pulses with the multiple channel information being frequency modulated on a subcarrier having a center frequency and multiplexed with said video spectrum at a level at least 20 db below the peak level of said video spectrum so that the intermodulation products of the multiple channel information and multiple harmonics of said video sync pulses are at a level at least 45 db below said video spectrum, said method comprising the steps of:

filtering the frequency modulated subcarrier and video spectrum to separate one from the other;

synthesizing substantially only the frequency modulated subcarrier by tracking a portion of said modulated subcarrier adjacent to and including said center frequency of said subcarrier, said portion tracked including less than the full deviation of said modulated subcarrier to exclude said intermodulation products; and

demodulating the synthesized modulated subcarrier.

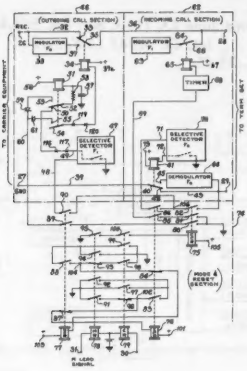
3,917,907
METHODS AND APPARATUS FOR 4-WIRE SWITCHING

Everhard H. B. Bartelink, Concord, N.H., assignor to Northeast Electronics Corporation, Concord, N.H.

Filed Jan. 12, 1971, Ser. No. 105,817
Int. Cl.² H04M *1/78*
U.S. Cl. 179—18 AF **23 Claims**

1. A method of providing effective 4-wire operation through a 2-wire communication circuit upon connecting the same between a pair of 4-wire communication circuits, which comprises the steps of: connecting said 2-wire circuit between a first and a second 4-wire circuit, and upon said connection, sending a control signal from each of said 4-wire circuits, to the other through said 2-wire circuit, detecting at each of said 4-wire circuits, the control signal sent thereto, in response thereto modulating on a local carrier the intelligence signal received in the receiving path of the first of said 4-wire circuits to form a modulated carrier wave signal, transmitting said modulated signal over said 2-wire circuit to the second said 4-wire circuit and demodulating the same in the transmitting

path thereof to recover said intelligence signal, and transmitting the intelligence signal received in the receiving path of



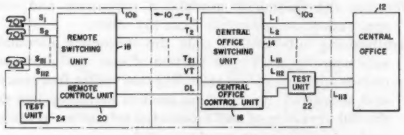
said second 4-wire circuit over said 2-wire circuit to the transmitting path of the first said 4-wire circuit.

3,917,908

CALL CONCENTRATOR WITH EXPANDED INTRACALL CAPABILITY

Vincent P. Galluccio, San Francisco, Calif., assignor to Lynch Communication Systems, Inc., San Francisco, Calif.

Filed June 19, 1972, Ser. No. 263,945
Int. Cl.[2] H04Q *3/60*
U.S. Cl. 179—18 FC **13 Claims**



1. A call concentrator for interposition between a plurality of remote subscribers and a central office having a like plurality of subscriber lines and switchgear associated therewith, comprising:

a. a central office portion including a central office switching unit and a central office control unit;

b. a remote portion including a remote switching unit and a remote control unit;

c. a plurality of trunks extending between said switching units, and a data link extending between said control units;

d. a plurality of central office subscriber lines connected to said central office switching unit, and a like plurality of remote subscriber lines connected to said remote switching unit;

e. means cooperating with said central office switchgear and a pair of said trunks for establishing an intracall in said call concentrator over said pair of said trunks;

f. means for detecting in said central office portion the establishment of an intracall between two of said remote subscriber lines which include:

i. a source of frequency-shift-keyed signals;

ii. a means for injecting said signals into a calling trunk when the called subscriber goes off-hook;

iii. means for scanning the remaining trunks of the system;

iv. means for detecting on a scanned trunk an FSK signal having the same frequencies, keying rate, and phase as the injected signal; and

v. means for conveying to said central office control unit the identity of the trunk on which said last-named FSK signal has been detected; and

g. means responsive to the detection of an intracall for connecting said intracall directly within said remote switching units and releasing both of said pair of trunks used in establishing said intracall as well as the central office switchgear which established said intracall.

2. A call concentrator for interposition between a plurality of remote subscribers and a central office having a plurality of subscriber lines and switchgear associated therewith comprising:

a. a central office portion including a central office switching unit and a central office control unit;

b. a remote portion including a remote switching unit and a remote control unit;

c. a plurality of trunks extending between said switching units, and a data link extending between said control units;

d. a plurality of central office subscriber lines connected to said central office switching unit, and a like plurality of remote subscriber lines connected to said remote switching unit;

e. means cooperating with said central office switchgear and a pair of said trunks for establishing an intracall in said call concentrator over said pair of said trunks;

f. means for detecting in said central office portion the establishment of an intracall between two of said remote subscriber lines;

g. means responsive to the detection of an intracall for connecting said intracall directly within said remote switching unit and releasing both of said pair of trunks used in establishing said intracall as well as the central office switchgear which established said intracall; and

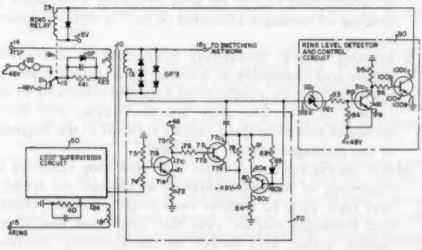
h. means for allowing operator verification of an intracall after said trunks and central office switchgear have been released.

3,917,909

RING INJECTION METHOD FOR TRANSFORMER COUPLED TELEPHONE

Max S. Macrander, Warrenville, and Ronald F. Kowalik, Lombard, both of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Mar. 7, 1974, Ser. No. 448,864
Int. Cl.[2] H04M *3/02*
U.S. Cl. 179—18 HB **6 Claims**



1. A ringing signal injection and termination system for use in a transformer coupled telephone communication network having at least one transformer having a primary with a tip and a ring side connected to a subscriber loop and a secondary connected to a telephone switching network, further the subscriber loop is connected to the telephone switching network.

and the subscriber loop has transducing means for transforming a ringing electrical signal to an audible ringing signal, said ringing signal injection and termination system comprising:

a ring generator means for producing an electrical ringing signal;

loop supervision means connected to the ring side of the transformer primary for producing an increased current output in response to off-hook conditions occurring within said loop;

level generator means connected to said loop supervision circuit and said tip side of the transformer primary for producing an increased voltage drop in response to an increased current output from said loop supervision network;

ring level detector and control means connected to said level generator means for producing an activating control current in response to said increased voltage drop from said level generator means; and

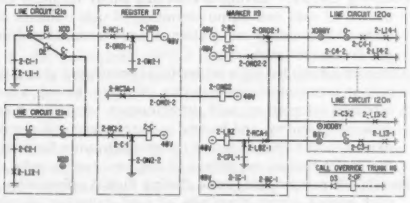
switching means connected to the said tip side of the transformer primary and said ring generator means and to said ring level detector and control means, for automatically connecting said ring generator means to said tip side of the transformer primary and subsequently disconnecting it in response to said activating control current;

whereby the ringing electrical signal is injected directly into the transformer primary to be transmitted to the subscriber phone transducing means and transduced into an audible ringing signal.

3,917,910
CIRCUITRY FOR PROVIDING CALL OVERRIDE IN A PBX SYSTEM IN ACCORDANCE WITH A SUPPLIED CLASS OF SERVICE

Carl Calvin Nielson, Boulder, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 3, 1974, Ser. No. 511,754
Int. Cl.[2] H04M *3/20*
U.S. Cl. 179—18 BH **10 Claims**



1. In a telephone switching system having a plurality of line circuits terminated in station sets, said line circuits being interconnectable to a plurality of trunk circuits through a multistage switching network, the invention comprising call override circuitry for completing a connection between a calling station and a called station said called station being busy as a result of a connection to a third station, said call override circuitry comprising

means for determining a class of service provided to said calling station,

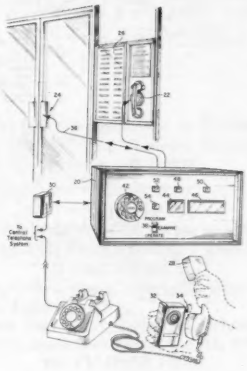
means for detecting a busy condition of said called station, means for determining a class of service provided to said called station, and

means for seizing said call override circuitry provided said calling station is equipped with a class of service permitting call override and said called station is equipped with a class of service allowing call override.

3,917,911
SECURITY ENTRY SYSTEMS

James M. Lesher, 7315 Lankershim Blvd., North Hollywood, Calif. 91609

Continuation-in-part of Ser. No. 319,043, Dec. 27, 1972, abandoned. This application Feb. 15, 1974, Ser. No. 442,771
Int. Cl.[2] H04M *11/00*
U.S. Cl. 179—37 **15 Claims**



1. A security entry system adapted for use in conjunction with a foyer telephone located outside of an entry gate, a central telephone system, and the telephones of a plurality of approving stations, for causing the foyer telephone to be electrically connected through the central telephone system to the telephone of a selected approving station and for enabling the latch release mechanism of the gate in response to a preselected type of signal applied from the telephone of the selected approving station, said security entry system comprising:

digital memory means for storing data representative of the telephone number of each of the approving stations at respective memory address locations defined by a preselected code number for each of the approving stations,

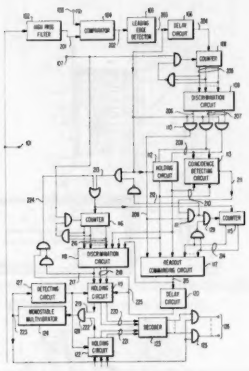
dialing means, responsive to a code number dialed on the foyer telephone, for retrieving from said digital memory means the telephone number data for the approving station which corresponds to the dialed code number, and for applying dial pulses representative of the retrived telephone number data to the central telephone system so as to cause the telephone of the selected approving station to be electrically connected through the central telephone system to the foyer telephone; and

actuation means electrically connected to the telephone of the selected approving station through the central telephone system, for enabling the latch release mechanism of the gate in response to said preselected type of signal applied from the telephone at the selected approving station, said actuation means including processing means for responding only to signals within a preselected frequency range and means for inhibiting the signal transmission operation of the foyer telephone during a period following the first detection of a signal within said preselected frequency range but before said latch release mechanism is enabled.

3,917,912
MULTIFREQUENCY DIALING SIGNAL RECEIVER FOR PUSH-BUTTON TYPE TELEPHONE SYSTEMS

Kunihiko Niwa, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Mar. 6, 1974, Ser. No. 448,582
Claims priority, application Japan, Mar. 6, 1973, 48-26710
Int. Cl.[2] H04M *1/50*
U.S. Cl. 179—84 VF 4 Claims

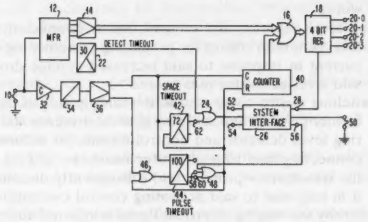


1. A multifrequency signal receiver for processing a multifrequency dialing signal for telephone switching, comprising means for separating the multifrequency signal into component frequency groups, means for discriminating a frequency in each of the frequency groups, characterized by comprising: a comparison circuit for comparing an output signal from a filter for each of the frequency groups with a predetermined first d.c. threshold voltage to determine whether the output signal is of a sufficient level and for delivering a binary signal if said output signal exceeds said first threshold voltage; a leading edge detecting circuit for detecting the leading edge of the output binary signal from the comparison circuit to deliver pulses upon each detection; a source of clock pulses; a first counter for counting the clock pulses under the control of the output from the leading edge detecting circuit; a first discriminating circuit for discriminating in response to the output from the first counter whether the output signal from the filter lies in one of the frequencies belonging to the specific frequency group; a second counter for measuring the number of unit periods of the output signal from the filter based on the output of the first discriminating circuit and the output of the leading edge detecting circuit; a third counter for counting the clock pulses; a read-out commanding circuit for judging the lapse of a predetermined guard time period from the output of the first discriminating circuit and the output of the second counter, and for delivering an instruction for reading out the counted values in the third counter; a second discriminating circuit for reading out the counted values in the third counter every time the read-out instruction is delivered and for determining whether the frequency deviation of the output signal from the filter is in a predetermined tolerable range; and a decoder connected to the output of said second discriminating circuit, whereby the frequency deviation of the output signal from the filter is determined to be in the tolerable range based on the guard time specified by predetermined receiving requirements said decoder producing an output signal once said predetermined receiving requirements have been met.

3,917,913
TELEPHONE CALLING SIGNAL TRANSLATING CIRCUITRY

Michael Allen Patten, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 3, 1974, Ser. No. 475,680
Int. Cl.[2] H04M *1/50*
U.S. Cl. 179—84 VF 8 Claims



1. A telephone calling signal translating circuit arrangement for a telephone signal exchange having alternating current handling circuitry in which rotary dial pulses are differentiated comprising

input terminals at which a train of such differentiated rotary dial pulses is applied,

detector circuitry having an input circuit coupled to said input terminals and having two output terminals, one of said output terminals delivering a triggering pulse at the leading impulse of a pulse of said train of pulses differentiated at said input terminals and the other of said output terminals delivering a triggering pulse at the trailing impulse,

counting circuitry having a counting input terminal connected to said one output terminal of said detector circuitry for counting said pulses, a reset terminal and output count terminals,

a timeout circuit having a set terminal connected to said one output terminal of said detector circuitry, having a reset terminal coupled to said other output terminal of said detector circuitry, and having an output terminal coupled to said reset terminal of said counting circuitry for halting the count therein regardless of any succeeding pulse,

thereby to present telephone dialing digital information at said output count terminals of said counting circuitry corresponding to said differentiated pulse calling signal.

3,917,914
LOUDSPEAKER

Rollin James Parker, Greenville, Mich., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 15, 1974, Ser. No. 451,482
Int. Cl.[2] H04R *11/02*
U.S. Cl. 179—115 R 3 Claims

1. A loudspeaker comprising:

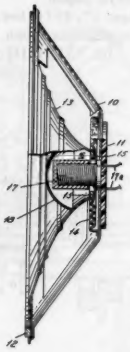
a vibratable cone having an open apex;

a ring magnet of the cobalt-rare earth type positioned with its peripheral circular surface within, and in solid contact with, the apex of said cone;

a magnetic circuit positioned within the ring of said magnet but not in direct contact therewith, said magnetic circuit extending interiorly of said vibratable cone;

an electromagnetic coil mounted on said magnetic circuit;

and means for positioning said vibratable cone, ring magnet, magnetic circuit and electromagnetic coil whereby



said ring magnet and cone are vibratable in response to an electrical signal impressed on said coil.

3,917,915

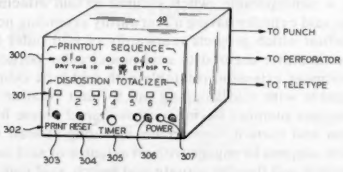
TELEPHONE SERVICE OBSERVATION SYSTEM

Ernest C. Karras, Chicago, Ill., assignor to Tekno Industries, Inc., Oak Park, Ill.

Filed July 9, 1973, Ser. No. 377,575

Int. Cl.[2] H04M *3/22*

U.S. Cl. 179—175.2 C **32 Claims**



1. An automatic service observation circuit comprising means for connecting said observation circuit between each of a plurality of telephone or trunk lines and individually associated terminals, means for sequentially and individually scanning each of said plurality of terminals, means for discriminating between originating and terminating call conditions appearing at each of said individually associated terminals, and means responsive of said discriminating means for displaying dial signals appearing at said associated terminals.

3,917,916

METHOD AND MEANS FOR INTERROGATION OF DIGITAL REPEATERED LINES

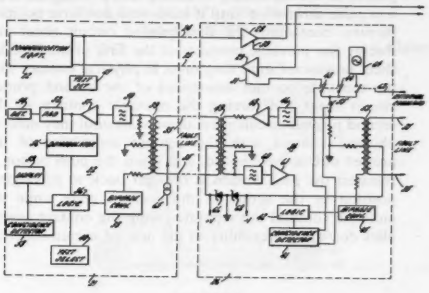
Suhas Ghosh, Naperville, and Robert Ruffatti, Joliet, both of Ill., assignors to Wescom, Inc., Downers Grove, Ill.

Filed Aug. 29, 1974, Ser. No. 501,786

Int. Cl.[2] H04B *3/46*

U.S. Cl. 179—175.31 R **22 Claims**

21. A method of interrogating a digital transmission line, said line having a plurality of regenerators interposed therein at spaced stations, said method comprising the steps of assigning a multi-bit digital address to each of said stations, coupling a test signal containing a test frequency component to the transmission line so that each regenerator produces an analog response thereto, providing a fault line coupling all of said stations, imposing a digital signal including the multi-bit digital address associated with a selected one of the stations on the fault line, receiving the digital address from the fault line at each station, detecting a coincidence of the digital signal and the digital address at the selected station, coupling the analog



response of the selected regenerator to the fault line in response to the coincidence, and receiving the analog response from the fault line for evaluation thereof.

3,917,917

KEYBOARD PUSHBUTTON SWITCH ASSEMBLY HAVING MULTILAYER CONTACT AND CIRCUIT STRUCTURE

Taneo Murata, Tokyo, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Aug. 22, 1974, Ser. No. 499,600

Claims priority, application Japan, Aug. 23, 1973, 48-94577

Int. Cl.[2] H01H *13/26*

U.S. Cl. 200—5 A **16 Claims**

1. A snap-acting, multicontact, multicircuit, pushbutton switch comprising:

a printed circuit base board provided with a plurality of fixed contact assemblies each connected to one pair of a first set of terminals;

a first printed circuit sheet made of an insulating flexible film, a plurality of movable contacts fixed on the rear side of said first printed circuit sheet;

a second printed circuit sheet interposed between said printed circuit base board and said first printed circuit sheet and made of an insulating flexible film, a plurality of movable contact assemblies fixed on the front side of said second printed circuit sheet each contact assembly connected to one pair of a second set of terminals, and a plurality of movable contacts at positions aligning with the contact assemblies on the front side thereof and fixed on the rear side of said second printed circuit sheet;

two insulating flexible film sheets, each having a plurality of holes at positions aligning with said contacts and being interposted between said first and second printed circuits sheets and between the second printed circuit sheet and the printed circuit base board respectively;

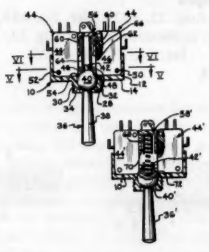
a plurality of push buttons arranged on the front side of the first printed circuit sheet in alignment with said plurality of movable contacts and contact assemblies, and a plurality of snap-action resilient spring plates, with one resilient

plate provided directly beneath each push button and without another metal spring for each push button, whereby when any one of the push buttons is depressed it pushes its corresponding resilient plate, pushing the resilient plate downward until it snaps into a reverse position thereby contacting the first printed circuit sheet and forcing the movable contacts of the first printed circuit sheet downward until they meet in physical contact with the movable contact assemblies of the second printed circuit sheet and forcing the movable contacts of the second printed circuit sheet downward until they meet in physical contact with the contact assemblies of the printed circuit base board, and when the push button is released the push button is brought back to its original position by the action of the resilient plate while the movable contacts are separated from the contact assemblies due to the flexibility of the printed circuit sheets.

3,917,918
CENTER BIASED JOYSTICK TYPE ACTUATOR IN A FOUR-WAY SWITCH ASSEMBLY

John T. Vannest, Jackson, Mich., and Charles W. Shaw, Flora, Ill., assignors to John T. Vannest, Jackson, Mich.

Filed Aug. 1, 1974, Ser. No. 493,524
Int. Cl.² H01H 25/04
U.S. Cl. 200—6 A **8 Claims**

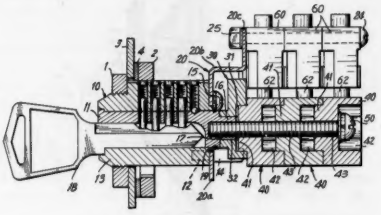


1. A four-way electrical switch comprising, in combination, a support base having a first side and a second side, a threaded mounting boss defined on said base extending from said first side, a control lever receiving bore defined in said base concentrically extending through said boss and base, a spherical bearing-receiving socket defined in said base concentric with said bore and intersecting said second side, a control lever having a spherical bearing received within said socket, a handle affixed to said bearing extending through said bore and extending from said first side and a switch actuator defined on said bearing in substantially diametrically opposed relation to said handle and extending from said bearing adjacent said base second side, four similar electric switches mounted upon said base engaging said second side, each switch having a casing, an actuating button, mounting means, and terminals, and base mounting means defined on said base extending from said second side engaging said switch mounting means positioning said casings upon said second side at 90° with respect to each other about said socket, said casings partially overlying and engaging said bearing maintaining said bearing in said socket and said buttons being disposed adjacent said switch actuator at 90° with respect to each other about said switch actuator for engagement thereby upon pivoting said lever, and resilient means engaging said control lever and biasing said control lever to a neutral position coincident with the axis of said bore.

3,917,919
SWITCH LOCK ASSEMBLY

Toru Tahara, Tokyo, Japan, assignor to Takigen Manufacturing Co., Ltd., Tokyo, Japan

Filed Apr. 17, 1974, Ser. No. 461,720
Claims priority, application Japan, Apr. 20, 1973, 48-46508
Int. Cl.² H01H 9/28
U.S. Cl. 200—44 **4 Claims**



1. A switch lock assembly comprising a tumbler lock which includes an outer barrel, a lock cylinder positioned rotatably within said barrel and having a plurality of pin bores which extend radially through said lock cylinder and at least a portion of said outer barrel, a driver pin and follower pin positioned within each of said pin bores and spring means positioned withnin each of said pin bores adapted to bias said pins towards said lock cylinder, a plurality of circumferentially spaced tapped holes in the rear face of said barrel, an attaching plate means detachably secured to said rear face of the barrel by means of screw means cooperable with said tapped holes, at least one stopping pin secured in at least one of said holes, a cam-operable switch secured to said attaching plate means, said cylinder having a rearwardly extending non-circular portion which projects rearwardly of said outer barrel, a stopper member secured to said non-circular portion of the lock cylinder extension rotatable with said lock cylinder and engageable with said stopping pin to limit rotation thereof, said stopper member having a cross-shaped recess formed in the rear end thereof, cam means including at least one cam element adapted to engage with an actuator of said cam-operable switch and thereby actuate said switch, said cam element having a projection in the front end thereof dimensioned to fit non-rotatably within said cross-shaped recess of said stopper member and a cross-shaped recess formed in the rear end thereof.

3,917,920
MANUALLY OPERATED ROTARY SWITCH AND COMBINATION LOAD CONTACT-FUSE CLIP THEREFOR

Ronald G. Pekrul, Southington; Louis T. Stegmaier, Plainville, and Joseph J. Mrowka, Bristol, all of Conn., assignors to General Electric Company, New York, N.Y.

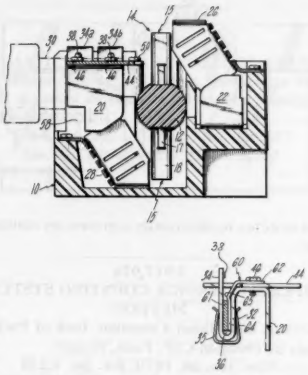
Division of Ser. No. 389,979, Aug. 20, 1973, Pat. No. 3,840,717. This application June 20, 1974, Ser. No. 481,055
Int. Cl.² H01H 1/42, 21/54, 85/22; H01R 11/22
U.S. Cl. 200—162 **2 Claims**

1. For use in a heavy duty rotary switch having an insulated housing including walls forming a switching chamber and journalling a rotor having a switching blade mounted thereon for rotation therewith to open and close an electric circuit, the improvement comprising, in combination:

A. a conductive strap formed of a unitary strip of metal bent into a generally S-shaped configuration to provide a load contact portion engageable with the switching blade and a fuse clip portion defining a slot for receiving a fuse terminal;

B. a support plate affixed to the housing to span the walls of the switching chamber;

C. mounting means engaging said strap intermediate its load contact and fuse clip portions to mount said strap to one side of said plate; and



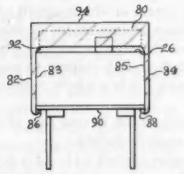
D. a conductive metal insert positioned in said slot to adapt said fuse clip portion for a smaller sized fuse terminal, said insert affixed to said strap to said mounting means.

3,917,921

SLIDE ACTUATED SWITCH

Alexander J. Jakubauskas, Chicago, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Sept. 11, 1974, Ser. No. 505,179
Int. Cl.² H01H 9/02
U.S. Cl. 200—333 **2 Claims**



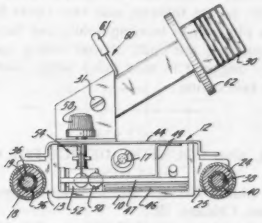
1. An electrical switch and cover assembly comprising a housing, a first lead having a first contact area, a second lead having a second contact area which overlaps said first contact area, an electrically insulated slide actuator slidable back and forth in said housing and having a projection thereon which in a first position of the slide actuator is not in contact with either said leads and in a second position of said slide actuator is in contact with said second lead so as to force said second contact area into contact with said first contact area, an aperture in a surface of said housing, an actuating member on said slide actuator which projects through said aperture to allow for external actuation of said switch, a cover for covering said aperture in said surface of said housing so as to substantially seal off leakage air paths associated with said aperture when a suction pick-up means is placed adjacent said apertured surface having snap-on holding means for temporarily securing said cover on said switch which fits over the top of said switch and comprises a pair of resilient legs that contact the sides of the switch and which have feet that grip the bottom of the switch.

3,917,922

DRY MOUNT APPARATUS

M. Jack Kirsch, Teaneck, N.J., assignor to Technal Corporation, Englewood, N.J.

Filed June 10, 1974, Ser. No. 477,696
Int. Cl.² H05B 1/00
U.S. Cl. 219—243 **6 Claims**



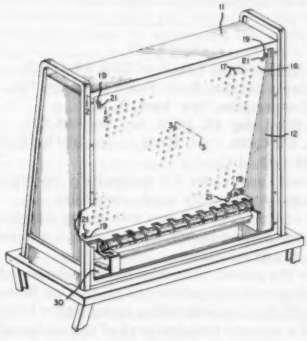
1. Apparatus for mounting photographs comprising in combination, a frame, a platen attached to said frame and formed with a flat smooth lower surface having leading and lagging edges, heating means for heating said platen, a cylindrical flattening roller rotatably mounted to said frame in front of said leading edge of said platen, a cylindrical cooling roller rotatably mounted to said frame rearward of said lagging edge of said platen, and handle means attached to said frame for positioning said lower surface of said platen and said flattening roller and said cooling roller into substantially coplanar firm contact with a photograph lying flat for attachment by a thermal dry mount medium to a planar support board and for moving said frame across said photograph with said flattening roller leading said platen and initially flattening said photograph against said planar support board prior to heating said photograph, and with said cooling roller following said heated platen for effecting a thermal bond of said photograph to said support board by first heating and thereafter cooling said photograph, said thermal dry mount medium and said support board.

3,917,923

PROTECTIVE PLATE FOR A VOTING MACHINE

Ransom F. Shoup, 400 Morris Ave., P.O. Box 389, Bryn Mawr, Pa. 19010

Filed Sept. 3, 1974, Ser. No. 502,678
Int. Cl.² G07C 13/00
U.S. Cl. 235—51 **6 Claims**



1. A voting machine comprising:
a vote counting mechanism,

a casing enclosing said vote counting mechanism and having an open rear portion for access to said vote counting mechanism,

a plurality of voting spindles each having an operating handle accessible to a voter at the front of said casing, and

a rear cover bearing plate secured in the open rear portion of said casing, said rear cover bearing plate being of sufficient size to close the rear open portion of said casing to prevent access thereto, said rear cover bearing plate having a plurality of bearing holes, one for each of said voting spindles, the ends of said voting spindles being rotatably disposed in said holes when said cover is in place in said casing.

3,917,924

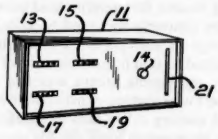
CONTROL AND COUNTING DEVICE FOR COPYING MACHINE

Burton Dale Linne, Chicago, Ill., assignor to Design America Corporation, Chicago, Ill.

Continuation of Ser. No. 347,835, April 4, 1973. This application Jan. 2, 1975, Ser. No. 537,907

Int. Cl.[2] G06K *15/18;* **H01H** *43/08;* **G06F** *7/38*

U.S. Cl. 235—61.6 L **2 Claims**



1. A card only controlled apparatus for controlling copies to be made by a photostatic copying machine and for counting the copies made by the machine, said apparatus operable in response to cards having a defined coding thereon, comprising, in combination, means for connecting the apparatus to the associated copying machine, receptacle means for receiving a selected one of the cards; first switch means operable only by a selected card having the defined coding thereon for causing the machine to permit a copy to be made, a plurality of counter means each responsive to a specific defined coding on a card, second switch means operable by a card with the specific defined coding thereon for enabling a particular one of said counters to be activated, and the particular one of said counters being activated in response to a signal developed when a copy is made by the copying machine, whereby a defined coding on each card causes the machine to permit a copy to be made and a selected counter to count responsive to a specific defined coding on said cards.

3,917,925

EMBOSSED CHARACTER READER

Eddy Humberto del Rio, Palm Beach Gardens, Fla., assignor to RCA Corporation, New York, N.Y.

Filed May 10, 1974, Ser. No. 468,931

Int. Cl. G06k *7/04;* **H04l** *15/18;* **H01h** *43/08*

U.S. Cl. 235—61.11 C **7 Claims**

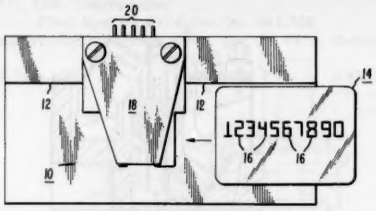
1. A record card reader for sequentially sensing a row of embossed characters on the card, comprising

a cluster of electrical switches with spring fingers arranged in a pattern corresponding with respective possible segments in said characters,

means for the guided movement of the embossed characters on said record card relative to said spring fingers,

a timing electrical switch with a spring finger located in the path of a segment included in all of said embossed characters, and having an offset trailing location to cause the timing switch to be operated at the moment when the electrical switch spring fingers of said cluster are registered with the possible segments of a character, and

means responsive to the operation of said timing switch to utilize the then-existing condition of said cluster of electrical switches to electrically represent an embossed character.



3,917,926

INTERFERENCE FRINGE COUNTING SYSTEM AND METHOD

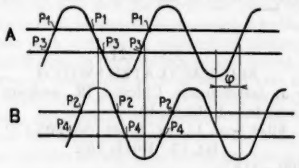
Andre Gerard, and Michel Lacombat, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jan. 20, 1970, Ser. No. 4,238

Claims priority, application France, Jan. 23, 1969, 69.1182

Int. Cl. H04l *3/00;* **G06f** *7/38;* **G06g** *7/00*

U.S. Cl. 235—92 GC **8 Claims**



1. Interferometer system having an interferometer (M) and a fringe counting system in which signals (A, B) are generated varying as a function of movement of interference fringes in the interferometer, the signals derived from the interferometer being phase shifted with respect to each other by a value of about π/n, in which n is a whole number greater than one, comprising

n similar channels, each having one of said signals applied thereto and each including

a threshold trigger circuit (**11, 21**), a differentiating network (**21, 22**) connected to said threshold trigger circuit, and

pulse polarity detection means (**31,32**) passing pulses derived from said differentiating network in one direction only, and providing separate outputs (**P1, P3; P2, P4**) of positive, or negative polarity, respectively, said outputs being in pulse form whenever a predetermined threshold level is passed;

a logic circuit (**4**) having said separate outputs from said channels applied thereto and decoding the number of fringes and the direction of passage of fringes from the sequence of pulses from said outputs, said logic circuit having a positive going count output (**C1**) and a negative going count output (**C2**);

and a bi-directional counter circuit (**61, 62; 8**) connected to the outputs (**C1, C2**) of said logic circuit and counting forward or reverse, or not at all, in dependence of the distribution of pulses at the outputs of said logic circuit, the transfer function of said logic circuit being:

a. a positive count output (**C1**) if successive pulses of the same polarity appear sequentially at the separate outputs at different channels;

b. a negative count output (**C2**) if successive pulses of opposite polarity appear sequentially at the separate outputs of different channels; and

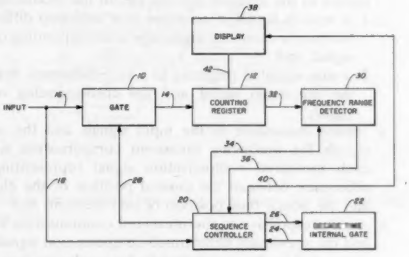
c. no output pulses if successive pulses of opposite polarity appear sequentially at the separate outputs of any one channel.

3,917,927

AUTOMATIC RANGING FREQUENCY COUNTER

Alfred L. Minton, Spring Hill, Kans., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 15, 1974, Ser. No. 460,857
Int. Cl.[2] H03K 21/30; G01R 23/02
U.S. Cl. 235—92 TF 7 Claims



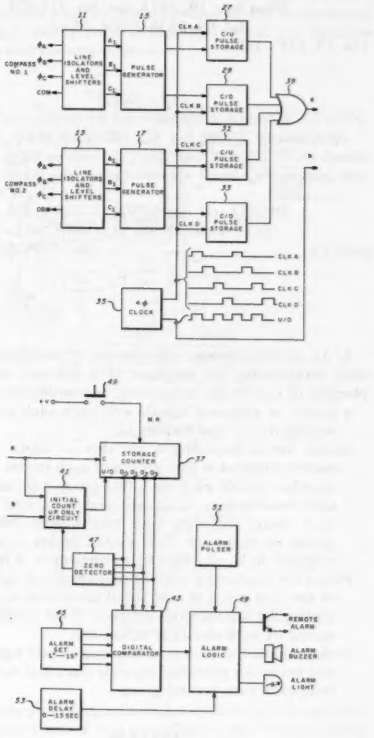
1. An automatic ranging frequency counter comprising:
a. means for providing an input signal of unknown frequency;
b. a single counting register;
c. means for gating said input signal to said counting register for a measured amount of time;
d. a frequency range detector for detecting and indicating the degree of filling of said counting register; and
e. a sequence controller for controlling the opening and closing of said means for gating, said controller being connected between the frequency range detector and said means for gating, said controller also being connected to said means for providing an input signal;
f. means for generating a plurality of a-c signals, said plurality of a-c signals forming a decade spectrum in frequency, each said a-c signal being, in frequency, a decade below the a-c signal above it and a decade above the a-c signal below it, said means being inhibited when said means for gating is not gating said input signal to said counting register as indicated by said sequence controller; and
g. means for selecting and passing one said a-c signal of said plurality of a-c signals to said sequence controller, the period of said one a-c signal being said duration of said measured amount of time, initially the highest frequency a-c signal is passed to said sequence controller providing an initial measured amount of time, said means for selecting and passing being controlled by said sequence controller such that after the initial highest frequency a-c signal is passed and the initial measured amount of time ends, if said frequency range detector indicates a specific degree of filling, said means for selecting and passing will pass the highest frequency a-c signal to said sequence controller, but if said means for detecting and indicating indicates a lack of a specific degree of filling, said means for selecting-and-passing will pass the a-c signal a decade in frequency below the last passed a-c signal to said sequence controller.

3,917,928

COMPARATOR FOR STEP DATA GYRO COMPASSES

Charles R. Wesner, Crozet, Va., assignor to Sperry Rand Corporation, New York, N.Y.

Filed June 4, 1974, Ser. No. 475,470
Int. Cl.[2] G06F 7/00
U.S. Cl. 235—92 CA 12 Claims



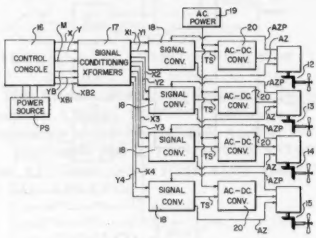
1. Apparatus for comparing the output signals from pairs of step data compasses, each of said compasses being of the type that produces output signals consisting of phase-displaced trains of N modulated pulses per degree of compass rotation, pulse conversion means for converting the output signals of each of the compasses into separate UP or DOWN pulse trains as the associated compass rotates in first or second directions respectively, said pulse conversion means being differentially connected so that rotation of both compasses in the same direction produces UP pulses from one compass and DOWN pulses from the other compass,
storage means for separately storing the UP and DOWN pulses of each compass,
clock means for sequentially interrogating the individual storage means,
means in said clock means for producing UP and DOWN control signals during the interrogation of UP and DOWN storage means, respectively,
storage counter means coupled to receive signals read out of each of said storage means in response to interrogating signals from said clock means,
means responsive to control signals from the clock means to cause said counter to count in opposite directions in response to pulses read out of UP and DOWN storage means respectively,

means to actuate an alarm after the count in said storage counter reaches a specified value.

3,917,929
SYSTEMS AND METHODS FOR SOLVING SIMULTANEOUS EQUATION

Tom R. Reinhart, Sugar Land, Tex., assignor to Baylor Company, Sugar Land, Tex.

Filed Nov. 19, 1973, Ser. No. 416,975
Int. Cl. B63h *25/04, 25/42*
U.S. Cl. 235—150.2 **34 Claims**



1. An electrical model of a plurality of simultaneous equations representing the response of a dynamic system to a plurality of conditions, comprising, in combination:

a source of electrical signals with each such signal representing one of said conditions;

circuit means including a plurality of signal responsive means arranged in first groups of such means connected together so that each such first group represents one of said simultaneous equations, and in second groups of such means including such means from different first groups so that each such second group represents the response to be provided by a component of the system;

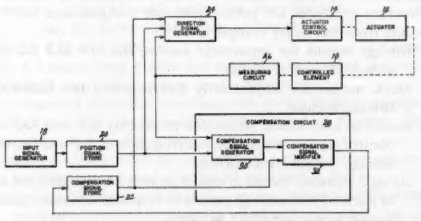
means for conducting each of said electrical signals to one of the first group of said signal responsive means representing the simultaneous equation of the condition represented by such electrical signal; and

means coupled to each second group of said signal responsive means for providing separate electrical output signals from each such second group.

3,917,930
METHOD AND APPARATUS FOR ADAPTIVELY POSITIONING A MACHINE ELEMENT

James Andrew Davey, Villa Hills, Ky.; Charles B. Perry, Cincinnati, Ohio, and Harvey William Rohmiller, Covington, Ky., assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Nov. 25, 1974, Ser. No. 526,584
Int. Cl.[2] G05B *13/02*
U.S. Cl. 235—151.11 **14 Claims**



1. An apparatus for iteratively modifying input signals representing desired changes of positions of a controlled element as a function of position errors generated during previous occurrences of said input signals, said apparatus being operative with an actuator control circuit for commanding an actuator to move the controlled element through cycles of positioning motions in response to the cyclic occurrence of the input signals, said controlled element being connected to a measuring circuit for producing an output signal representing the actual position of the controlled element, the apparatus comprising:

a. storage means for storing compensation signals, said storage means including means for producing initial compensation signals;

b. means having one input responsive to the input signals and a second input connected to the storage means for producing command signals, each command signal representing the algebraic sum of an input signal and a corresponding previously determined compensation signal;

c. means having inputs responsive to the command signals and the measuring circuit and having an output connected to the actuator control circuit for producing

1. a motion signal in response to a non-zero difference between a command signal and a corresponding output signal, and

2. a stop signal in response to a zero difference between the command signal and the corresponding output signal;

d. means repsonsive to the input signals and the output signals for producing measured compensation signals, each measured compensation signal representing the difference between the desired position of the element and the actual final position of said element; and

e. means responsive to the measured compensation signals and the previously determined compensation signals and connected to the storage means for producing new compensation signals and loading said new compensation signals in the storage means in place of the corresponding previously determined compensation signals whereby said new compensation signals operate as the previously determined compensation signals during a subsequent occurrence of the input signals.

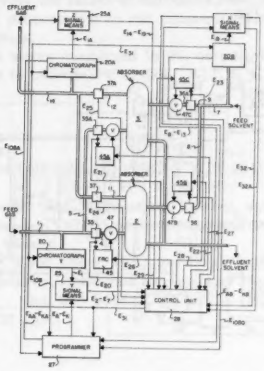
3,917,931
MEANS AND METHOD FOR CONTROLLING AN ABSORBER SYSTEM

Donald E. Sweeney, Jr., Beaumont, Tex., assignor to Texaco Inc., New York, N.Y.

Filed May 3, 1974, Ser. No. 461,061
Int. Cl.[2] G06F *15/46;* **B01D** *55/00*
U.S. Cl. 235—151.12 **14 Claims**

1. A system for controlling an absorber system having two or more absorbers, each absorber receives feed gas and feed solvent and provides effluent gas and effluent solvent, comprising means for monitoring the feed solvents, the feed gases to the absorbers and the effluent gases from the absorbers and providing signals corresponding to quantities of components in the feed solvent, quantities of the components in the effluent gas and quantities of the components in the feed gas and to the flow rates of the feed solvents, of the feed gases and of the effluent gases means for controlling the flow rates of the feed solvent and the feed gas to each absorber and of the effluent gas from each absorber in accordance with control signals, means for providing signals corresponding to the economic values of the components, and means connected to the monitoring means, to the economic signal means and to control means for providing the control signals to the control means in accordance with signals from the monitoring means

and from the economic signal means so as to control the flow rates of the effluent gases, the feed gases and the feed solvents



to achieve an optimum operating condition for the absorber system.

3,917,932
GENERATION OF DIGITAL FUNCTIONS

Nobuo Saita, and Yoichi Tanaka, both of Iruma, Japan, assignors to Kabushiki Kaisha Yaskawa Denki Seisakusho, Tokyo, Japan

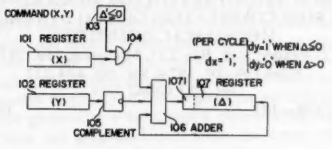
Continuation of Ser. No. 127,289, March 23, 1971, Pat. No. 3,763,363. This application June 11, 1973, Ser. No. 368,533

The portion of the term of this patent subsequent to Oct. 2, 1990, has been disclaimed.

Claims priority, application Japan, Mar. 24, 1970, 45-25093; Mar. 27, 1970, 45-26190; Apr. 9, 1970, 45-30967; Sept. 19, 1970, 45-82403

Int. Cl.[2] G06F *15/46*

U.S. Cl. 235—152 **10 Claims**



1. A function generating system comprising, relative to an objective value (X,Y) in a plane, a first register for storing a numerical value X, a second register for storing a numerical value Y smaller than X, a gate for passing the output of the first register when the qualitative value (positive, negative, or zero), for a preceding operational result Δ', is zero or negative, and for blocking the same when said qualitative value is positive, a complement circuit coupled to receive an output signal from the second register, an adder circuit for adding the preceding operational result Δ' and output signals from said gate and said complement circuit, and a third register having an input coupled to the output of said adder circuit for receiving the present operational result Δ therefrom and including means for storing the quantity Δ and for feeding back its own output as an input to the adder circuit for the succeeding operation, wherein the present value for Δ is determined as

$$\Delta = \begin{cases} \text{(preceding operational result } \Delta')+X-Y & \text{(for preceding operational result } \Delta' \leqq 0) \text{ and;} \\ \text{(preceding operational result } \Delta')-Y & \text{(for preceding operational result } \Delta'>0), \end{cases}$$

where pulse distribution is periodically carried out for the X axis, so that when said present value at $\Delta \leqq 0$, one pulse distribution is effected for the Y axis, said system further comprising means for adding one quantized unit to the second register each time a pulse is generated in the axis direction related to said numerical value Y.

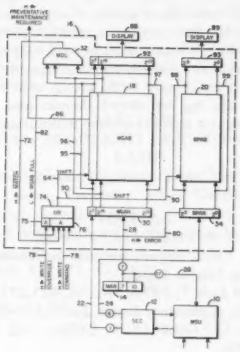
3,917,933
ERROR LOGGING IN LSI MEMORY STORAGE UNITS USING FIFO MEMORY OF LSI SHIFT REGISTERS

James H. Scheuneman, St. Paul, and John R. Trost, Anoka, both of Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Dec. 17, 1974, Ser. No. 533,565

Int. Cl.[2] G11C *29/00*; **G06F** *11/00*

U.S. Cl. 235—153 AK **4 Claims**



1. In a data processing system that includes an LSI semiconductor memory system that is configured into M word groups of N bit planes per word group and B bits per bit plane, each bit plane being a replaceable component upon the detection of a single defective device or bit therein that provides a correctable error upon readout and single error correction circuitry coupled to said memory system for generating upon the detection of each correctable error in said memory system an error word that is associated with only the one of the N bit planes of the one of the M word groups in which the correctable error is detected, said error word comprising a single tag bit 2^T and S syndrome bits, said tag bit indicating that a correctable error has occurred in said one of the M word groups in the one of the N bit planes that is identified by said S syndrome bits, and a memory address register for addressing said LSI semiconductor memory system and holding the W ordered bits that address the one selected word group and the X ordered bits that address the one selected bit on each bit plane in the one selected word group, the improvement comprising:

a word group address buffer comprised of 1 + W shift registers, each of Y ordered stages in length, the like-ordered stages of said 1 + W shift registers arranged to form Y address registers each of 1 + W stages in length;

a bit plane address buffer comprised of S shift registers, each of Y ordered stages in length, the like-ordered stages of said S shift registers arranged to form Y syndrome registers, each of S stages in length;

a word group address register of 1 + W ordered stages for receiving the W ordered bits of said word group address from said memory address register and coupling each ordered bit of said word group address to the like-ordered one of said W shift registers of said word group address buffer, and for receiving said tag bit 2^T from said single error correcting circuitry and coupling said tag bit to said 1 shift register of said word group address buffer;

a bit plane address register of S ordered stages for receiving the S ordered bits of said syndrome bits from said single error correction circuitry and coupling each ordered bit of said S syndrome bits to the like-ordered one of said S shift registers of said bit plane address buffer;

comparator means for comparing the tag bit and the word group address stored in each of said Y address registers of said word group address buffer to the tag bit and to the word group address stored in said word group address register and generating a miss signal only if no match is found;

means coupled to said comparator means for shifting the contents of each of the Y address registers of said word group address buffer and the contents of each of the S syndrome registers of said bit plane address buffer one stage and loading the contents of said word group address register into the first address register of said word group address buffer and the contents of said bit plane address register into the first syndrome register of said bit plane address buffer when activated by said miss signal;

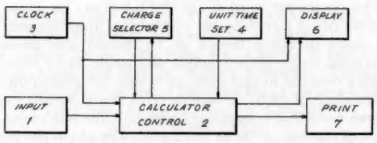
means coupled to the 1 shift register stage of one of the Y address registers of said word group address buffer for monitoring the tag bit stored therein and alerting the machine operator that preventive maintenance should be scheduled.

3,917,934

CHARGE CALCULATOR

Mitsuhiro Goto, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed June 7, 1974, Ser. No. 477,271
Claims priority, application Japan, June 12, 1973, 48-65414
Int. Cl.² G06F *15/20*; G07B *15/02*
U.S. Cl. 235—156 **8 Claims**



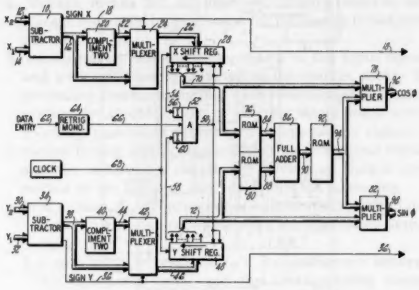
1. A charge calculator comprising calculating means, a clock for providing an indication of current time, means for transmitting time data from said clock to said calculating means, said calculating means calculating a net time in response to said time data and an external calculating instruction, said calculating means dividing the net time by a predetermined unit time to obtain a quotient, and charge decoding means for decoding a charge corresponding to the quotient, said calculating means multiplying said charge by said net time to obtain a total charge, said charge decoding means including a semiconductor matrix board for establishing charge-setting according to said quotient, whereby charge-setting can be readily established by selection of an appropriate semiconductor matrix board.

3,917,935

REDUCTION OF LOOK-UP TABLE CAPACITY

Stanislaw V. Lazecki, Norwalk, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 23, 1974, Ser. No. 536,051
Int. Cl.² G06F *7/39*, *15/34*
U.S. Cl. 235—156 **2 Claims**



1. A circuit for reducing the storage capacity of a memory look-up table which, in response to its input address consisting of a plurality of data bits representative of the numerical values of numbers on which an arithmetic function is to be performed, provides information to a system calculating the arithmetic ratio of two numbers, comprising:

a pair of shift registers each, for receiving the plurality of data bits representing a related number;

means presenting a clock signal for providing synchronous operation of said shift registers;

gate means for selectively applying said clock signal to said shift registers for shifting the data bits in said registers toward their more significant values whenever the magnitude of the largest of the two input numbers contains a quantity of data bits less than the maximum number permitted by the capacity of the system word; and

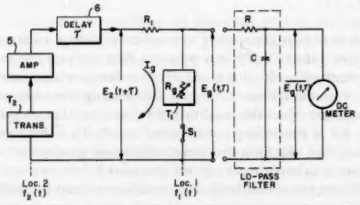
means for providing the outputs of said shift registers comprising the more significant values of the shifted data bits to the input address lines of the memory look-up table.

3,917,936

METHOD AND APPARATUS FOR MEASURING THE CROSS-CORRELATION OF TWO DYNAMIC MECHANICAL QUANTITIES

Wayne T. Reader, P.O. Box 237, Monrovia, Md. 21770

Filed Feb. 20, 1974, Ser. No. 444,222
Int. Cl.² G06G *7/19*
U.S. Cl. 235—181 **10 Claims**



3. An apparatus for measuring the cross-correlation function of two quantities comprising:

first means for sensing a first mechanical quantity and for generating a first electrical signal related to a first mechanical quantity;

second means including a sensing means energized by said first electrical signal for generating a second electrical signal related to the product of the first and the second mechanical quantity;

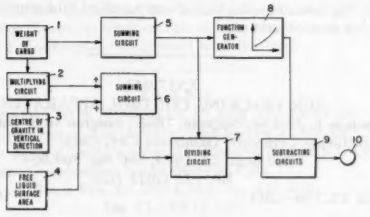
third means connected to the output of said second means to average the output of said second means to produce a signal proportional to the cross-correlation of the two quantities;

a fourth means connected to the output of the averaging means to indicate the output.

3,917,937
SYSTEM FOR ESTABLISHING THE ATHWARTSHIP STABILITY OF A SHIP

Leif Ragnvald Sten, Staffanstorp, Sweden, assignor to Kommanditbolaget AB Lastfordelningsinstrument & Co., Malmo, Sweden

Filed July 6, 1973, Ser. No. 376,986
Claims priority, application Sweden, July 28, 1972, 9860/72
Int. Cl.² G06G 7/70; G01M 1/12
U.S. Cl. 235—193 **2 Claims**

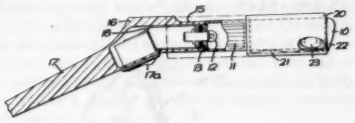


1. A system for establishing the athwartship stability of a ship with respect to the cargo in each cargo space, the centre of gravity of the cargo and the free surface area of any liquid in a space, said system comprising means for generating for each space a first signal representing the weight of cargo within said space, means generating a second signal representing the centre of gravity of the cargo in the vertical direction, and means generating a third signal representing free liquid surface area and generated only when the cargo within the space is a liquid cargo having a free surface area, means supplying said first signals to a summing circuit for generating a signal representing the displacement of the ship and to a multiplying circuit together with said second signals for generating signals representing the vertical moments of the respective cargoes, means supplying said vertical moment signals to a second summing circuit and means adding thereto third signals for generating a signal representing the total vertical deadweight moment modified by said third signals with respect to free liquid area, when generated, means supplying last said generated signal to a subtracting circuit together with a signal representing the metacentric position of the ship above the keel line, multiplied by the displacement of the ship minus the lightweight moment of the ship, from said second summing circuit, means supplying the difference signal on the output of the subtracting circuit to a dividing circuit together with a signal representing the displacement of the ship therein to generate a quotient signal representing the metacentric height and thus the athwartship stability of the ship.

3,917,938
INTERIOR LIGHTS FOR MOTOR VEHICLES

Stephen Salvador Ferrada, Kenilworth; Ronald David Wisdom, Coventry, and Thomas Geoffrey Rex Fleming, Bitteswell, all of England, assignors to Chrysler United Kingdom Limited, London, England

Filed Feb. 28, 1974, Ser. No. 446,917
Claims priority, application United Kingdom, Mar. 2, 1973, 10311/73
Int. Cl.² B60Q 3/02
U.S. Cl. 240—7.1 R **5 Claims**

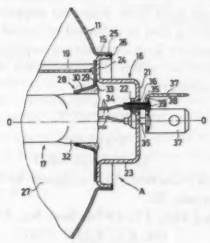


1. An interior light for a motor vehicle comprising an elongate lamp body having an end provided with a section having a ligh diffuser and a light source enclosed within the diffuser to provide diffused light, an opaque cover slidably mounted on the lamp body for linear movement along the length of the body to selectively cover and expose the light diffuser, the cover having two lens mounted therein and facing in divergent directions to provide focused beams of light directed in said divergent directions when the cover is covering the diffuser.

3,917,939
SEALED-BEAM HEADLIGHT EMPLOYING A HALOGEN LAMP

Hans-Joachim Schmidt, Ditzingen; Ernst Merkl, Stuttgart, and Gerhard Lindae, Leonberg, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

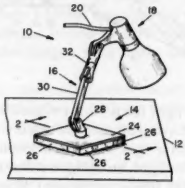
Filed July 5, 1973, Ser. No. 376,927
Claims priority, application Germany, Oct. 11, 1972, 2249630; July 5, 1972, 2232905
Int. Cl. F21m 3/00
U.S. Cl. 240—41 SB **15 Claims**



1. A gas-tight vehicular headlight comprising, in combination, a cup-shaped reflector having a smaller open end and a larger open end and a neck portion extending in direction substantially axially of said cup-shaped reflector in the region of said smaller open end; a diffuser glass closing off said larger open end; a halogen lamp at least in part located within the interior of said cup-shaped reflector said halogen lamp comprises a bulb having a rear portion and electrodes leading out from said bulb through said rear end thereof; and means connecting said halogen lamp to said reflector at said neck portion thereof in nondismountable seal-tight manner, and wherein said means comprises a bulb holder member, said rear end portion of said bulb being accommodated in said bulb holder member and maintained in position therein by a cementing material, and wherein said means further comprises a lamp support member fixedly connecting said bulb holder member to said neck portion of said reflector and holding said

halogen lamp in a predetermined position with respect to said neck portion, and wherein said electrodes are gas-tightly connected with said lamp support member, and further comprising plug members connected to said electrodes at the rear side of said headlight.

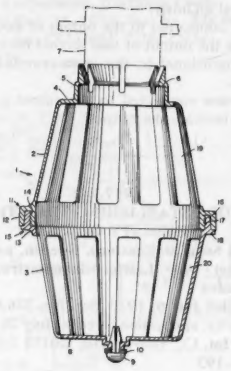
3,917,940
MAGNETIC BASE UTILITY LAMP
James J. Duddy, 514 N. Metcalf St., Lima, Ohio 45801
Filed May 15, 1974, Ser. No. 470,177
Int. Cl.[2] F21L *15/18*
U.S. Cl. 240—52.15 **5 Claims**



1. A magnetically attachable light adapted to be removably supported upon steel or iron-containing objects by firm magnetic connection or upon non-magnetic surfaces, said light comprising in combination, a base plate of flat geometric configuration of substantial area, light support means having one end extending through said plate and projecting thereabove substantially from the center of one surface of said plate, an electric light socket supported by said light support means in a position above said one surface of said plate, an electric cord connected to said socket and connectable to a source of current, and a plurality of similar elongated flat permanent magnets connected fixedly to the opposite surface of said base plate adjacent at least substantially all peripheral edges thereof to provide a space to accommodate a portion of said light support means adjacent said one surface of said plate and also provide a perimetric arrangement of magnets on said base plate to provide an effective widely spaced area of magnetic force upon said base plate to support the same effectively against tilting and accidental removal of the base of said lamp from a steel or iron-containing supporting surface when attached thereto or when otherwise set upon a horizontal non-magnetic supporting surface.

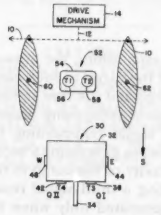
3,917,941
LAMP GUARD
Tony Trevithick, Gurnee, Ill., assignor to Daniel Woodhead, Inc., Northbrook, Ill.
Filed Oct. 17, 1974, Ser. No. 515,697
Int. Cl.[2] F21V *15/02*
U.S. Cl. 240—102 R **7 Claims**

1. A lamp guard comprising,
a. a first enclosure member formed of a flexible material adapted to have a lamp mounted therein, and having a circular inner end portion,
b. a second enclosure member also formed of a flexible material and having a circular inner end portion cooperating with said first enclosure member to form the completed guard,
c. the outer end of at least one of said members having a smaller diameter than the inner end thereof,
d. an axially extending annular groove around one of said members adjacent the inner end thereof having inner and outer walls,
e. an axially extending annular rib around the other of said members having inner and outer faces thereon and received within said annular groove of said one member, and



f. means removably securing said members together including interengaging threads on a wall of said groove and on a face of said rib.

3,917,942
SUN TRACKING CONTROL APPARATUS
Thomas E. McCay, Norman, Okla., assignor to Brown Manufacturing Company, Oklahoma City, Okla.
Filed Sept. 23, 1974, Ser. No. 508,054
Int. Cl.[2] G01J *1/20*
U.S. Cl. 250—203 **10 Claims**

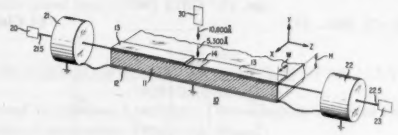


1. Sun responsive control apparatus including a plurality of vanes for interception of sunlight across a selected plane, which vanes are synchronously driven in response to control circuitry, comprising:
sun sensor means disposed between two of said vanes and generating a track signal output indicating need for vane movement;
quadrant sensor means disposed in sunlight and having plural sunlight sensors located about a shade plate directed perpendicular to said plane and generating sun quadrant signal output;
logic circuit means receiving both said track signal and quadrant signal output to generate a command output; and
control means receiving said command output to drive said vanes for the duration of said command output.

3,917,943
PICOSECOND SEMICONDUCTOR ELECTRONIC SWITCH CONTROLLED BY OPTICAL MEANS

David Henry Auston, Mountainside, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 21, 1974, Ser. No. 525,886
Int. Cl.² H01J *39/12*
U.S. Cl. 250—211 J **14 Claims**



1. Apparatus comprising

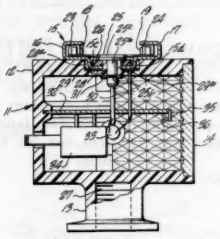
a. a body of semiconductor having a major surface upon which is located a pair of electrode segments separated by a gap;

b. optical source means for directing a first beam of radiation at said gap sufficient to produce charge carriers at the surface of the semiconductor, which thereby significantly increase the electrical conductivity across the gap and electrically complete a contact between said segments, and for directing a second beam of radiation on the body commencing at a predetermined time after said first beam has commenced, which is sufficient to produce electronic charge carriers in the bulk of the semiconductor sufficient to short-circuit at least one of the segments to a ground plane in contact with the body.

3,917,944
RADIATION SENSITIVE FLASH APPARATUS

Gary Eisenberger, Los Angeles, and Steven Z. Muzslay, Van Nuys, both of Calif., assignors to Optigon Research & Development Corporation, Santa Monica, Calif.

Filed Feb. 11, 1974, Ser. No. 441,410
Int. Cl.² H01J *5/02*
U.S. Cl. 250—239 **20 Claims**



1. A flash triggering device for use with an electronic flash unit of the type having a hot shoe comprising a mounting shoe for physically mounting said flash unit and electrical terminal means on said mounting shoe for triggering said flash unit to produce a flash, the improvement comprising

body means forming a housing for said triggering device, said body means having a top and said body means having at least a side portion thereof transparent to light,

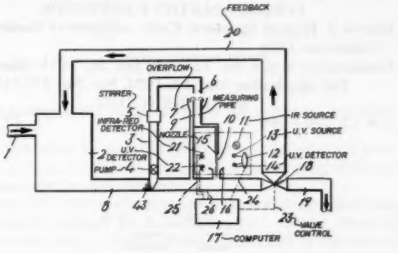
said body means including light sensing means for receiving light passing through said transparent portion of said body means, said light sensing means being responsive to received light for providing an electrical signal in response to the receipt of a predetermined amount of light, hot shoe means on said top of said body means mounted for rotation about an axis substantially normal to said top of said body means and for releasably receiving and mounting the hot shoe of an electronic flash unit, said hot shoe means comprising flange means for mechanically mating with the mounting shoe of an electronic flash unit for physically coupling an electronic flash unit with said slave device and for providing a first electrical connection between an electrical terminal of the hot shoe of the electronic flash unit and said light sensing means, said flange means being coupled with said body means for rotation with respect thereto about said axis, a portion of said flange means forming an electrical conductor providing a slidable rotary electrical contact with an electrical conductor connected to said light sensing means, and

said hot shoe means including an electrical contact mounted on said top of said body means substantially coaxially with said axis of rotation of said hot shoe means, said electrical contact having a first portion for providing a second electrical connection between a second electrical terminal of the hot shoe of the electronic flash unit, and having a second portion electrically connected to said light sensing means.

3,917,945
METHOD AND APPARATUS FOR DETECTING THE DEGREE OF CONTAMINATION OF WASTE WATER

Shunzo Sema, Tokyo, and Ikuo Sakurada, Kokubungi, both of Japan, assignors to Katsuhiki Hayashi, Tokyo, Japan

Filed June 10, 1974, Ser. No. 477,743
Claims priority, application Japan, June 21, 1973, 48-69174; Aug. 18, 1973, 48-97054[U]
Int. Cl.² G01T *1/167*; **G01J** *1/42*
U.S. Cl. 250—301 **14 Claims**



1. A method of measuring the degree of contamination of waste water, comprising the steps of forming a constant flow of the waste water, projecting light upon said constant flow, detecting the quantity of fluorescence emitted by said constant flow and the quantities of the infrared rays and ultraviolet rays absorbed by said constant flow, and analyzing the result of detection for determining the degree of contamination of the waste water.

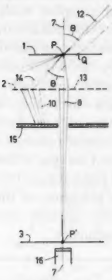
3,917,946
ELECTRON-OPTICAL DEVICE FOR THE RECORDING OF SELECTED DIFFRACTION PATTERNS

Karel Jan van Oostrum, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 348,062, April 5, 1973, abandoned. This application June 14, 1974, Ser. No. 479,468
Claims priority, application Netherlands, Apr. 12, 1972, 7204859
Int. Cl.² H01J *37/26*
U.S. Cl. 250—307 **8 Claims**

1. A method of generating and selectably recording diffraction patterns of a specimen in an electron microscope, comprising the steps of directing an illumination electron beam in a first direction at a substantially fixed angle to said specimen, wherein said specimen is located at the intersection of a specimen plane with the optical axis of the microscope and said illumination beam is inclined at an acute angle to said axis, projecting in a fixed second direction a portion of the beam

diffracted from the specimen, on an image plane in which said second direction coincides substantially with said axis, inter-

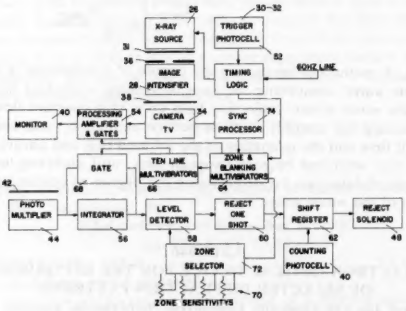


cepting remaining portions of the beam, and varying said first direction of the illumination beam while recording the projected diffraction pattern in said image plane.

3,917,947
FOREIGN PARTICLE DETECTOR

Marvin J. Fenton, Stamford, Conn., assignor to Borden, Inc., Columbus, Ohio

Continuation of Ser. No. 327,060, Jan. 26, 1973, abandoned. This application May 15, 1974, Ser. No. 470,761
Int. Cl.² G01N *23/02*
U.S. Cl. 250—360 **23 Claims**

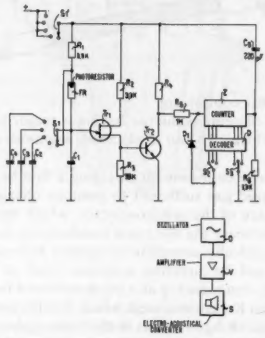


1. Inspection apparatus comprising X-ray source connected to an electrical power source for delivering X-rays across a path in the form of discrete beams, means connected to and being in phase with said power source for continuously moving test objects along said path, means actuated by said test objects for actuating said power source to allow a beam of X-rays to be emitted as one of the test objects becomes registered at an inspection station, detecting means for receiving the X-rays, means for analyzing the X-rays received by said detecting means and comparing them with a pre-set value, and means for rejecting certain of the test objects in response to actuation by said analyzing and comparing means.

3,917,948
DEVICE FOR MEASURING THE DOSE OF ULTRAVIOLET RADIATION IN THE ERYTHEM-EFFECTIVE RANGE

Ernst Strutz, Zurich, Switzerland, assignor to Biviator S.A., Grenchen, Switzerland

Filed Feb. 7, 1974, Ser. No. 440,579
Claims priority, application Germany, Sept. 18, 1973, 2346917
Int. Cl.² G01J *1/42*
U.S. Cl. 250—372 **14 Claims**

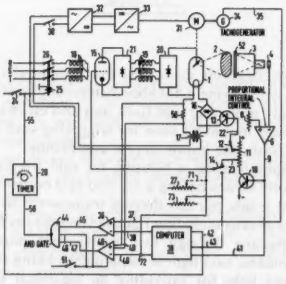


1. A device for measuring the radiation dose of both natural and artificial ultra violet radiation in the erythem-effective wavelength range of 280–315 nm, comprising an optical filter for passing radiation in said range, oscillator means directly responsive to radiation passed by said filter for generating a pulse train having a pulse repetition frequency proportional to the instantaneous intensity of said filtered radiation, a pulse counter counting the number of pulses corresponding to the product of radiation intensity with the irradiation time, and means coupled to said pulse counter for evaluating the sum of the accumulated pulses.

3,917,949
X-RAY DIAGNOSIS APPARATUS FOR FEEDING AN X-RAY TUBE HAVING A ROTARY ANODE

Hans-Werner Winkler, Buckenhof, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Continuation-in-part of Ser. No. 371,444, June 19, 1973. This application Sept. 23, 1974, Ser. No. 508,405
Int. Cl.² H05G *1/70*
U.S. Cl. 250—402 **2 Claims**



1. An X-ray diagnosis apparatus, comprising an X-ray tube with a rotary anode, a motor connected with said anode for driving it, means connected with said tube for determining its exposure time, means supplying a filament and exposure cur-

rent to the X-ray tube, means connected with the first-mentioned means for permitting an exposure during the high drive of the anode at its lowermost speed at which the exposure current is permissible and the desired filament current has been reached, the last-mentioned means comprising comparator means connected at its output with the means for determining the exposure time and having actual value and nominal value inputs, which are connected with actual value pick-ups and nominal value selectors for the filament current and the anode speed respectively.

3,917,950

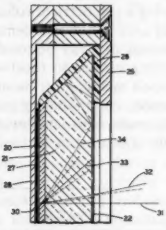
FLUOROSCOPIC SCREEN WHICH IS OPTICALLY HOMOGENEOUS

Roland W. Carlson, Lyndhurst, Ohio, assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Apr. 8, 1974, Ser. No. 458,555

Int. Cl.² G01T *1/00*

U.S. Cl. 250—483 **17 Claims**



1. A fluoroscopic screen comprising an assembly of a light-transparent supporting plate optically coupled by a light-transparent bonding layer to an optically homogeneous plate of light-transparent X-ray fluorescent material, the said assembly having a beveled edge.

3,917,951

ELECTRIC IRRADIATION APPARATUS

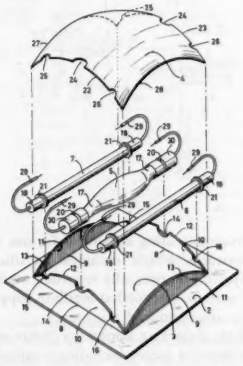
Tjerk Akkerman, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed June 12, 1974, Ser. No. 478,608

Claims priority, application Netherlands, June 22, 1973, 738699

Int. Cl.² A61N *5/08*

U.S. Cl. 250—495 **4 Claims**



1. An electric irradiation apparatus which comprises a face plate having at least one aperture, a reflector cap disposed on one side of the plane of said face plate, and being dimensioned and configured for alignment with said aperture, a plurality of elongated irradiation members disposed with the axes thereof in parallel relationship, the axial extremities of each member engaging said reflector cap, each axial portion of each of said irradiation members intermediate said axial extremities being disposed in spanning relationship to said aperture wherein said, face plate comprises two elongated planar members disposed in generally coplanar parallel relationship transverse to the longitudinal axes of said irradiation members, two lips, each elongated planar member being joined to a lip extending in perpendicular relationship to said face plate, the edge of said lip remote from the plane of said face plate adjoining the circumferential edge of said reflector cap, said axial extremities of said irradiation members each projecting between said edge of said lip and said circumferential edge of the reflector cap.

3,917,952

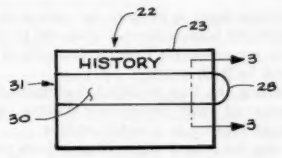
RADIOGRAPHIC RECORD AND FILM IDENTIFICATION ASSEMBLY

Dwight S. Jackson, 6035 N. Ibbetson Ave., Lakewood, Calif. 90713

Filed Mar. 21, 1974, Ser. No. 453,648

Int. Cl.² G03B *41/16*

U.S. Cl. 250—476 **7 Claims**



1. A radiographic record and film identification assembly, comprising:

a. a first sheet of material for receiving deformation pressure to record data thereon and for transmitting deformation pressure therethrough:

b. a second sheet of material deformable under pressure and partially opaque to X-radiation, said second sheet of material disposed beneath said first sheet of material in juxtaposition thereto for receiving the deformation pressure transmitted through said first sheet of material and for transmitting deformation pressure therethrough;

c. means for securing said first sheet to said second sheet;

d. adhesive means secured to said second sheet to provide a means for securing said second sheet to a surface;

e. a third sheet of material secured to said second sheet, said third sheet of material further including a transfer medium thereon, said transfer medium being capable of being activated by means of deformation pressure received from said second sheet by said third sheet of material from said second sheet of material.

3,917,953

METHOD FOR DECREASING RADIATION HAZARD IN TRANSPORTING RADIOACTIVE MATERIAL

Donald D. Wodrich, Kennewick, Wash., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Apr. 3, 1974, Ser. No. 457,531

Int. Cl. G21c *19/20*

U.S. Cl. 250—506 **9 Claims**

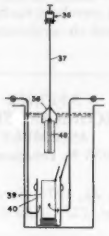
1. In a method in which the loading of a nuclear material cask is modified at a submerged zone in a pool of water contaminated with radionuclide materials, the improvement which consists of:

providing a submarine container having a fresh water supply line;

placing the nuclear material cask in a sealed zone substantially submerged in fresh water in said container and

substantially continuously supplying pressurized fresh water to provide within the protective zone between the interior sidewalls of the container and the exterior sidewalls of the cask water pressure greater than the water pressure in the pool of contaminated water, whereby any leakage between such protective zone and the pool is from the fresh water in the protective zone to the contaminated pool water;

moving the combination of container, water pressure supply line, and nuclear material cask between a surface station and a submerged location in said contaminated pool;



transferring items to or from the nuclear material cask to modify the loading thereof while the cask is submerged while preserving the exterior sidewalls of said cask protected by fresh water;

transferring the thus modified combination of container, pressurized water, and nuclear material cask from a submerged location to a surface station;

removing the nuclear material cask from the container at the surface station, the exterior sidewalls of the cask having minimized deposits from the contaminated pool water because of the continuous fresh water pressure contacting all of the principal outside surfaces of the cask during its placement, transportation, and removal from said container.

3,917,954

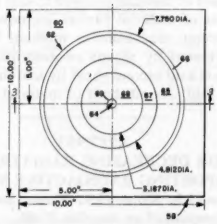
EXTERNAL X-RAY BEAM FLATTENING FILTER

Raymond J. Boge, LaCrosse, Wis., assignor to Gundersen Clinic, Ltd., LaCrosse, Wis.

Filed Nov. 9, 1973, Ser. No. 414,363

Int. Cl.[2] H01J *5/16*

U.S. Cl. 250—510 **1 Claim**



1. An external filter for flattening a plurality of large x-ray fields of an x-ray beam produced by a linear accelerator of the type having means for producing x-rays, means for collimating the x-rays into an x-ray beam having a longitudinal axis, and first filter means in said collimating means for roughly shaping said fields of the beam, said external filter comprising:

A. a single solid disc-shaped member semi-permeable to said x-rays and peripherally symmetrically shaped in the configuration of said x-ray field about a central axis, said disc-shaped member comprising:

i. a planar lower surface lying in a plane perpendicular to the central axis; and

ii. a geometrically shaped upper surface defined relative said lower surface by:

a. a first ring-shaped surface parallel to said lower surface, defining a washer shaped volume therebetween about said central axis;

b. a second surface linearly radially extending from said lower surface to an outwardly directed peripheral edge of said first surface, defining a ring having a geometrical volume of triangular cross-sectional area about said central axis;

c. a third surface radially extending from an internally directed edge of said first surface toward said central axis and terminating at a circle thereabout, defining a ring having a geometrical volume of polygon shaped cross-sectional area about said central axis; and

d. a fourth surface forming a radially directed extension of said third surface in the direction of said central axis and terminating at said lower surface, defining a ring having a geometrical volume of triangular cross-sectional area about said central axis; and

B. mounting means of x-ray permeable material, having a planar mounting surface to receive the lower surface of said disc-shaped member for mounting said disc-shaped member thereon, said mounting means being adapted for mounting alignment with said linear accelerator such that said longitudinal beam axis and said disc central axis are colinear.

3,917,955

COORDINATE DETECTING APPARATUS FOR USE WITH OPTICAL PROJECTING APPARATUS

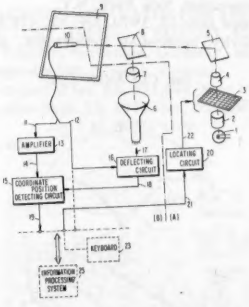
Masafumi Inuiya, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Sept. 6, 1974, Ser. No. 503,568

Claims priority, application Japan, Sept. 6, 1973, 48-100592

Int. Cl.[2] G01J *1/20*

U.S. Cl. 250—549 **4 Claims**



1. A coordinate detecting apparatus for use with an optical projecting apparatus which includes an illuminating light source for projecting an optically recorded medium, an illuminating optical system, a recorded-medium support member, a projecting optical system and a screen,

said coordinate detecting apparatus comprising:

light spot generating means including a cathode-ray tube for generating a light spot to scan the screen on which an optical picture image is projected in a composed manner, a deflecting circuit and a composite projecting optical system;

photoelectric detecting means for detecting the light spot on the screen; and

coordinate position detecting means responsive both to the photoelectrically detected output signal of said photoelectric detecting means and to the deflecting signal of said cathode-ray tube for detecting the coordinate position of said photoelectric detecting means on the screen.

3,917,956

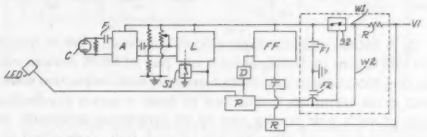
SMOKE DETECTOR

William J. Malinowski, Pembroke, Mass., assignor to Pyrotector, Incorporated, Hingham, Mass.

Filed Mar. 8, 1974, Ser. No. 449,362

Int. Cl.² G08B *17/10*

U.S. Cl. 250—564 **9 Claims**



1. In a smoke detector of the type utilizing photo-electric detection of light reflected from smoke particles (in which) having a light source which is energized intermittently, first means including a photo-responsive device (is provided) and an amplifier to produce energy pulses in response to light pulses refected from smoke particles, and second means utilizing said energy pulses to control a signalling device, the improvement comprising a voltage supply for said first means, a capacitor connected across the voltage supply, and third means between the capacitor and the voltage supply for isolating the (amplifier) first means and the capacitor from voltage pulses occurring at the power supply at least during the time that the light source is emitting light.

3,917,957

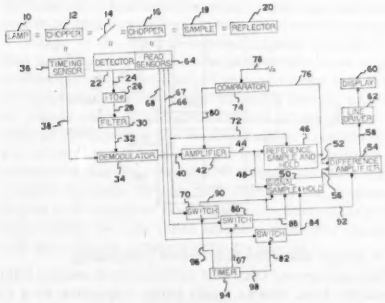
TRANSMISSOMETER

Ronald W. Ansevin; Melvin L. Lowry, both of Pittsburgh, and John E. Traina, Glenshaw, all of Pa., assignors to Contraves-Goerz Corporation, Pittsburgh, Pa.

Filed Oct. 21, 1974, Ser. No. 516,144

Int. Cl.² G01N *21/26*

U.S. Cl. 250—573 **9 Claims**



1. An improved transmissometer of the type wherein a modulated light beam of a pre-selected frequency is passed through a gaseous sample, and wherein said light beam is reflected back through said sample by a retro-reflector positioned across said sample from the source of said modulated light beam, said improved transmissometer comprising, in combination:

a main light-sensing means, positioned out of the path of travel of said modulated light beam, for generating an electrical signal representative of the amount of light falling thereon;

a movable chopping means, having at least three distinct segments, for sequentially and in repeating cycle, moving said three segments into the path of said modulated light beam, said segments including: a cut-out portion to allow passage of said modulated light beam through said sample; a first reflector portion to reflect back substantially all of said modulated light beam; and a second reflector portion to reflect back a pre-selected percentage of said modulated light beam;

means, positioned in the path of travel of said modulated light beam in advance of said chopping means, for passing said modulated light beam toward said chopping means and directing any light from said retro-reflector or said first or second reflector portions onto said main light-sensing means;

first electronic means for receiving and presenting as a constant output signal for each cycle of said chopping means, the electrical signal representative of the light reflected by said first reflector portion;

second electronic means for receiving and presenting as a constant output signal for each cycle of said chopping means, the electrical signal representative of the light reflected by said retro-reflector;

electronic subtraction means for subtracting said electrical signal representative of the light reflected by said retro-reflector from said electrical signal representative of the light reflected by said first reflector portion; and

sequencing means, connected to said first and second electronic means, for generating an individual electrical signal indicating the presence at said main light-sensing means of light reflected by said retro-reflector, said first reflector portion or said second reflector portion.

3,917,958

MISFET (METAL -INSULATOR-SEMICONDUCTOR FIELD-EFFECT TRANSISTOR) LOGICAL CIRCUIT HAVING DEPLETION TYPE LOAD TRANSISTOR

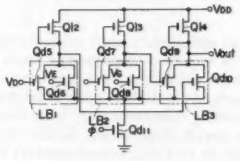
Yoshikazu Hatsukano, Kodaira, Japan, assignor to Hitachi, Ltd., Japan

Filed July 23, 1973, Ser. No. 381,485

Claims priority, application Japan, Aug. 25, 1972, 47-84565

Int. Cl.² H03K *19/08, 19/34, 19/22;* **G11C** *19/28*

U.S. Cl. 307—205 **3 Claims**



1. A MISFET logic circuit comprising:

a first terminal to which a source of D.C. potential is supplied;

a second terminal serving as a common terminal;

a third terminal to which ground potential is applied;

a plurality of depletion type MISFETs each having a drain electrode connected to said first terminal, and a source electrode and a gate electrode connected together;

a plurality of logic blocks, each having a reference terminal, an output terminal, and at least one input terminal, the output terminals being connected to the respective source electrodes of said depletion type MISFETs and the reference terminals being connected to said second terminal, each of said logic blocks comprising at least one

first enhancement type MISFET having a drain electrode connected to the output terminal thereof, a gate electrode connected to a respective input terminal, and a source electrode coupled to the reference terminal thereof;

a second enhancement type MISFET having a resistance lower than said at least one first enhancement MISFET and having a drain electrode connected to said second terminal, a source electrode connected to said third terminal, and a gate electrode;

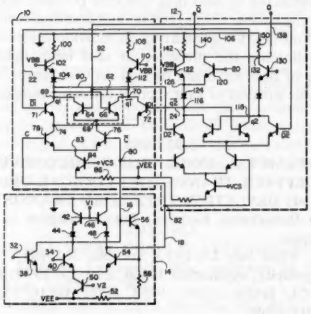
means for supplying a clock pulse signal to the gate electrode of said second enhancement type MISFET; and

means for supplying input signals to said input terminals, thereby causing the logic functions to be effected by said logic blocks only during the period of the width of the clock pulse.

3,917,959
HIGH SPEED COUNTER LATCH CIRCUIT

Frank J. Swiatowiec, Tempe, and Ramachandra A. Rao, Scottsdale, both of Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed May 2, 1974, Ser. No. 466,427
Int. Cl.² H03K *21/00*
U.S. Cl. 307—223 R **7 Claims**



1. A high speed integrated circuit counter comprising:

a. a plurality of serially interconnected latch circuit stage means having terminal means adapted for connection to a power supply and including a pair of latch output terminals for providing complementary latch output signals;

b. each latch circuit stage means further including input circuit means for receiving complementary data signals at a pair of input terminals and a directly cross-coupled semiconductor cell connected to its said respective input circuit means, each of said cross-coupled cells having a pair of cell output terminals for providing complementary output signals;

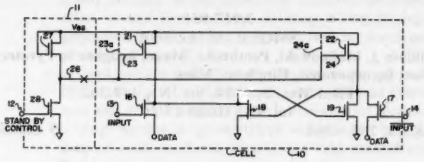
c. clock circuit means connected to each of said input circuit means for generating a pair of complementary control signals for setting each of said cross-coupled cells to a predetermined state in conjunction with the applied complementary data signals; and

d. each stage including active semiconductor cascode load circuit means coupled between each of said pair of cell output terminals and the terminal means adapted for connection to the power supply for providing isolation at each of said cell output terminals and for supplying load current to a selected side of said cross-coupled cell.

3,917,960
MOS TRANSISTOR LOGIC CIRCUIT

James F. Kane, San Jose, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Filed Jan. 31, 1974, Ser. No. 438,266
Int. Cl.² H03K *17/00, 3/353*
U.S. Cl. 307—238 **5 Claims**

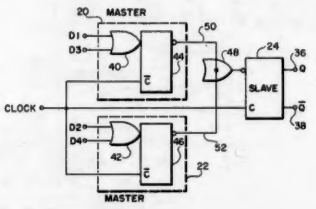


1. A MOS transistor logic circuit comprising: MOS transistor cell means including at least one pair of MOS devices each having gate, source and drain terminals with respective source and drain terminals connected to form a series connection, one of such pair having one of its remaining terminals, not connected to said other device of such pair, connected to a power supply voltage source and in a normal operating condition serving only as a resistive load for the other device of the pair whereby power is continuously dissipated, said other device having logic input means which is the sole such means of said pair; stand-by control means comprising a pair of MOS devices with respective source and drain terminals connected to form a series connection, said devices having a predetermined resistive ratio, one of such devices having a control input for receiving a logic control signal for switching said cell means between said normal condition and a stand by condition where substantially less power is dissipated, said stand-by control means connecting the other remaining terminal of said resistive load MOS device to said power supply voltage source in response to a normal logic control signal and for substantially disconnecting such terminal from said voltage source in response to a stand by logic control signal.

3,917,961
CURRENT SWITCH EMITTER FOLLOWER MASTER-SLAVE FLIP-FLOP

L. J. Reed, Mesa, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed June 3, 1974, Ser. No. 475,695
Int. Cl.² H03K *3/286, 17/60*
U.S. Cl. 307—243 **8 Claims**



1. A master slave flip-flop circuit comprising:

a. first and second OR/NOR current switch emitter follower master logic blocks, each being responsive to a clock signal first signal level for storing data signals and providing a logic output signal at a common terminal means,

b. a current switch emitter follower slave inverter logic block connected to the common terminal means and being responsive to a block signal second signal level for receiving and storing the logic output signal for providing an inverted output signal of the logic output signal at an output terminal means.

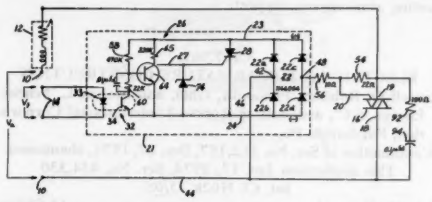
3,917,962
SYNCHRONOUS SWITCHING CIRCUIT

Joseph E. Pascente, Norridge, Ill., assignor to Grigsby-Barton, Inc., Rolling Meadows, Ill.

Continuation of Ser. No. 350,118, April 11, 1973, abandoned, which is a continuation-in-part of Ser. No. 231,652, March 3, 1972, Pat. No. 3,758,793. This application Mar. 4, 1974, Ser. No. 447,675

Int. Cl. H03k *17/72*

U.S. Cl. 307—252 UA **7 Claims**



1. In a circuit for selectively triggering a control thyristor having anode, cathode and gate terminals, at the zero crossing of the voltage of an a.c. source, comprising a full-wave rectifier circuit having input terminals for operable connection thereof to the a.c. source, a zero-voltage crossing detector circuit having load terminals for connection across the anode and cathode of the control thyristor and across the output of said rectifier circuit and including a transistor having a control terminal and a pair of load terminals for controlling the application of current from one of said load terminals to the gate terminal of the control thyristor, said transistor conducting current through said load terminals to thereby shunt current away from said gate terminal when the transistor is in its conductive state, and permitting the flow of current at said gate terminal of the control thyristor for triggering the same when said transistor is in its non-conductive state, and switching means connected between the control terminal and the other of said load terminals of said transistor for continuously maintaining said transistor in conduction when said switching means is non-conductive,

the improvement wherein said zero-voltage crossing detector circuit includes a first resistor connected between the anode of the control thyristor and said one load terminal of said transistor, a second resistor connected between the anode of the control thyristor and the control terminal of said transistor, a third resistor series connected with said switching means between said control terminal and said other load terminal of said transistor, said second and third resistors defining a voltage divider for applying a voltage to the control terminal of said transistor such that it is biased to its non-conductive state when said a.c. source voltage passes through zero and when said switching means is conductive, said transistor thereby providing an output pulse to the gate terminal of the control thyristor corresponding to the zero-voltage crossing of the a.c. source and the control thyristor being latched in a conductive state by current flow through said first resistor coupled between the gate and anode of the thyristor so long as said transistor remains non-conductive, said transistor being the sole three terminal transistor device in said zero-voltage crossing detector circuit.

3,917,963
SAMPLING CIRCUIT

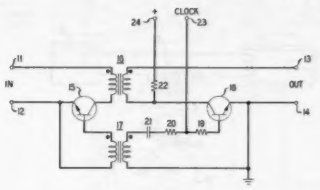
James Carroll Wadlington, Summit, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 21, 1973, Ser. No. 389,640

Int. Cl.² H03K *17/00*

U.S. Cl. 307—254 **4 Claims**

1. A sampling circuit comprising a pair of input terminals, a pair of output terminals, a first transistor, a transformer having a primary winding and a secondary winding, means connecting the collector and emitter of said first transistor to respective extremities of said primary winding, means connecting the base and collector of said first transistor between said input terminals, means connecting said secondary winding between said output terminals, and strobing means for



inducing a flux field in said transformer, said circuit characterized in that:

said means connecting said secondary winding between said output terminals includes the base-to-emitter path of a second transistor; and

means are connected to said second transistor to forward-bias its collector-to-emitter path.

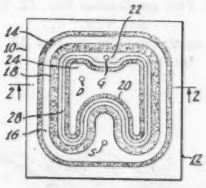
3,917,964
SIGNAL TRANSLATION USING THE SUBSTRATE OF AN INSULATED GATE FIELD EFFECT TRANSISTOR

David J. Carlson, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 17, 1962, Ser. No. 245,063

Int. Cl. H03k *3/26, 19/08*

U.S. Cl. 307—304 **27 Claims**



1. A signal translating circuit comprising,

an insulated-gate field-effect transistor of the type having gate, source and drain electrodes formed on a semiconductor substrate,

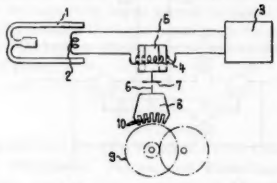
circuit means coupled between said gate and source electrodes for establishing an operating characteristic of said transistor;

input circuit means coupled between said substrate and said source electrode for applying signals to be translated, and output circuit means coupled between said source and drain electrodes for developing output signals corresponding to those applied between said substrate and said source electrode.

3,917,965
TRANSMISSION DEVICE FOR A HOROLOGICAL MECHANISM

Gaston Raval, La Neuveville, Switzerland, assignor to OMEGA Louis Brandt & Frere S.A., Bienne, Switzerland

Filed June 2, 1971, Ser. No. 149,173
Claims priority, application Switzerland, June 24, 1970, 9530/70
Int. Cl.[2] H02K *7/06*
U.S. Cl. 310—21 **11 Claims**

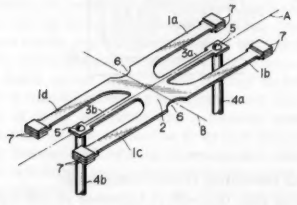


1. A transmission device for converting vibratory movement into rotary movement in a horological mechanism, comprising at least one oscillatable magnetized member and one index wheel presenting at least one toothed track, said wheel also being of magnetizable material and both said member and said wheel having periodically repeated toothlike poles of the same pitch thereon, said magnetized member having a comb formed into a plurality of individual poles, the pitch of said poles being equal to the pitch of the teeth on the said track so that all the poles of the magnetized member are simultaneously in the same relative positions with respect to the teeth of the track, said track being formed from at least two stampings on which said teeth extend from the base material and are bent laterally, and means for oscillating said magnetized member in a direction substantially parallel to the axis of said index wheel.

3,917,966
VIBRATOR

Seiki Mizutani, and Yasuyoshi Kaneda, both of Tokyo, Japan, assignors to Kabushiki Kaisha Hattori Tokeiten, Japan

Continuation of Ser. No. 215,492, Jan. 5, 1972, abandoned, which is a continuation-in-part of Ser. No. 4,831, Jan. 22, 1970, abandoned. This application Dec. 12, 1974, Ser. No. 531,978
Claims priority, application Japan, Jan. 23, 1969, 44-5537
Int. Cl.[2] H02K *33/00*
U.S. Cl. 310—25 **9 Claims**

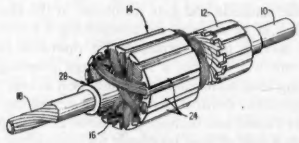


1. A vibrator comprising: a base section having four flexural vibratory arms extending outwardly therefrom in an H-shaped configuration, said vibratory arms normally lying in a common plane with said base section and said base section having a width dimension greater than the width dimension of said vibratory arms and having a greater width dimension at its two end portions located adjacent said vibratory arms than at its midportion; means connecting said four flexural vibratory arms to said base section to undergo flexural vibration out of and into said common plane; means defining cutouts at both ends of said base section along the transverse axis of symmetry of said H-shaped configuration effectively torsionally coupling together adjacent ones of said vibratory arms; at least one pair of supporting arms extending outwardly from said base section in a direction defining an axis of symmetry of said flexural vibratory arms and cooperative together when mounted on a support to limit vibration of said vibrator to a normal vibrating mode wherein said four flexural vibratory arms undergo flexural vibration out of and into said common plane without including a vibrating component of any spurious vibrating modes; and means for mounting said at least one pair of supporting arms upon a support.

3,917,967
ELECTRIC MOTOR ARMATURE CONSTRUCTION

Russell O. Robison, Plymouth, Ohio, and Malvin L. Fender, Elloree, S.C., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 212,157, Dec. 27, 1971, abandoned. This application Jan. 17, 1974, Ser. No. 434,330
Int. Cl. H02k *15/08*
U.S. Cl. 310—42 **13 Claims**



1. In an electric motor armature assembly having an armature core mounted on an armature shaft and having walls which define a plurality of conductor-receiving slots, an armature winding wound on said core and having at least one conductor extending through said slots, a plurality of insulating liners positioned one in each of said slots for electrically insulating said winding from the slot-defining walls of said core, said liners extending at both ends axially beyond said slots, and a molded one-piece member coaxially receiving said shaft and having a sleeve portion and a pair of retainer portions extending radially from said sleeve portion, said member being formed from electrical insulating material, said sleeve portion being disposed between said core and said shaft and electrically insulating said shaft from said core, said retainer being positioned and dimensioned to be engageable with said liners at least during the initial stage of winding said winding on said core for resisting axial dislodgement of said liners from said slots.

3,917,968
AREA FLOOD GUN

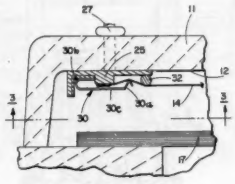
Gilberto Di Benedetto, Torrance, and James K. Thomson, Palos Verdes Peninsula, both of Calif., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 22, 1974, Ser. No. 444,798
Int. Cl.[2] H01J *1/88, 19/42*
U.S. Cl. 313—272 **2 Claims**

1. In an electron flood gun for providing a uniform flow of electrons over a predetermined area, said gun comprising elongated filament means for generating electrons, flat deflector electrode means encompassing substantially said predetermined area and proximate to said filament means in a first direction therefrom and flat director electrode means parallel to said deflector electrode means and proximate to said filament means in a direction therefrom opposite to said first direction and towards which the flow of electrons is desired, and a casing, said gun being mounted within said casing, the improvement including:

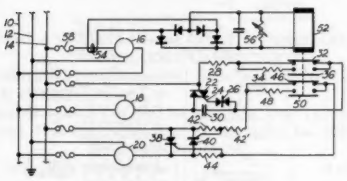
said deflector electrode means being formed on one of the walls of said casing, and

means for resiliently supporting the filament means in spaced relationship from the deflector electrode means in a plane parallel to said deflector electrode means, said resilient means comprising a spring member resiliently tensioning one end of each of said filament means,



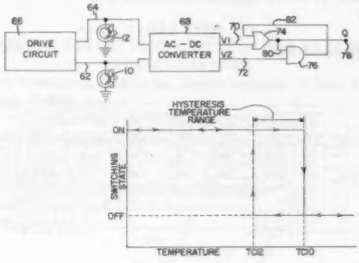
said spring members each comprising a bent over portion at one end thereof and further including a rod member fixedly mounted adjacent to said spring members, the filament means being passed over said rod member and resiliently urged against said rod member by the bent over end portions of the spring members.

3,917,969
ELECTRIC LOAD CONTROL
John G. Olsen, 3125 NE. Flanders St., Portland, Oreg. 97232
Filed Nov. 16, 1973, Ser. No. 416,477
Int. Cl.² H03K *17/60*
U.S. Cl. 307—11 **6 Claims**



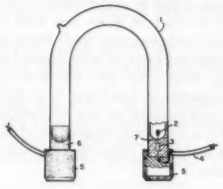
1. A control for an electric load circuit connected to an electric supply circuit, comprising:
a. thyristor means in said load circuit arranged in series with the load,
b. the thyristor means including a gate control element having an electric gate voltage supply circuit,
c. switch means in said gate voltage supply circuit for selectively supplying and removing gate voltage for said thyristor means,
d. electric switch operator means having an electric circuit, and
e. a current transformer in the electric switch operator means and arranged to operatively couple the circuit of the switch operator means to said electric supply circuit in parallel with the circuit of the load for sensing the electric current in said supply circuit,
f. the electric switch operator means being activated upon attainment of a predetermined magnitude of sensed current in the supply circuit to operate the switch means to open the electric load circuit.

3,917,970
TEMPERATURE SENSOR WITH HYSTERESIS
Edward F. Sidor, Lombard, and Rand J. Eikelberger, Glenview, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.
Filed Dec. 23, 1974, Ser. No. 535,475
Int. Cl.² H01L *37/04*; **G01K** *7/38*
U.S. Cl. 307—117 **6 Claims**



1. A temperature sensor comprising a first inductively wound magnetic core having a first Curie temperature, a second inductively wound magnetic core having a second Curie temperature which is greater than said first Curie temperature, and electrical circuit means coupled to said first and second inductively wound cores which provides an output signal that changes from a first state to a second state at the time the ambient temperature affecting said cores increases to said second Curie temperature and which maintains said second state signal until said ambient temperature decreases to said first Curie temperature, at which time said circuit means provides an output signal which reverts to said first state.

3,917,971
METAL HALIDE DISCHARGE LAMP HAVING A THERMALLY INSULATIVE END COATING
Martin E. Muzeroll, Manchester, N.H., assignor to GTE Sylvania Incorporated, Danvers, Mass.
Filed Mar. 22, 1974, Ser. No. 453,695
Int. Cl.² H01J *61/52*
U.S. Cl. 313—43 **1 Claim**

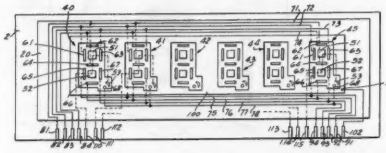


1. An unjacketed metal halide arc discharge lamp comprising a U-shaped glass arc tube having a fill including inert starting gas, mercury and metal halide and containing an electrode at each end of the U, the ends of said U-shaped arc tube being sealed and containing a glass-to-metal seal and being covered with a thin metal reflective coating which is overcoated with a bonded thermally insulative coating, the thickness of said insulative coating being such that, during vertical lamp operation with both ends of the U downward and upon extinguishment of the lamp, said insulative coating maintains sufficient heat in said ends to prevent condensation of said fill at said glass-to-metal seal of both of said ends.

3,917,972
MULTI-POSITION INDICATOR DISPLAY TUBE

Yuzuru Yanagisawa, Fujisawa; Akio Ohgoshi, Tokyo; Akira Yamanaka, Fuchu, and Shoichi Muramoto, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Division of Ser. No. 365,334, June 4, 1973, abandoned, which is a continuation of Ser. No. 177,990, Sept. 7, 1971, abandoned. This application July 23, 1973, Ser. No. 381,796
Claims priority, application Japan, Sept. 11, 1970, 45-80378
Int. Cl.² H01J *61/067, 61/66*
U.S. Cl. 313—519 **3 Claims**



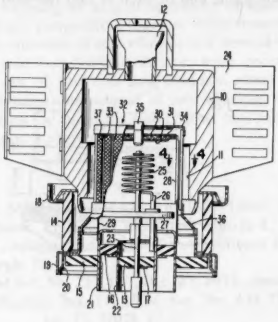
1. An indicator display tube comprising:
a plate of an insulating material;
a plurality of interconnecting leads formed on said plate;
a first insulating layer formed on said plate over said plurality of interconnecting leads with windows aligned with said interconnecting leads;
a plurality of indicator units formed on said first insulating layer and each consisting of a number of strip conductive elements and a plurality of selecting leads on said first insulating layer with said indicator units and said selecting leads connected to corresponding ones of said interconnecting leads through said windows respectively; certain of said strip conductive elements comprising cathode gaseous discharge sustaining display electrodes and others of said strip conductive elements comprising anode gaseous discharge sustaining and counter electrodes;
barrier means of electrically conductive material formed on said first insulating layer and formed with openings in which said associated strip conductive elements of said indicator units are mounted;
a second insulating layer formed on said selecting leads;
a transparent cover attached to said plate and forming an envelope for enclosing said indicator units and barrier means;
an ionizable gas sealed in said envelope, said first insulating layer being formed of glass and said strip conductive elements and said selecting leads being formed of silver; said first insulating layer of glass formed partially over the edges of said strip conductive elements to leave a portion thereof uncovered, a first layer of nickel deposited over said uncovered portions of said conductive elements, and a second layer of nickel formed over said first layer of nickel and extending partially over said first insulating layer of glass.

3,917,973
ELECTRON TUBE DUPLEX GRID STRUCTURE

Jules S. Needle, Palo Alto, and William H. Sain, Belmont, both of Calif., assignors to Varian Associates, Palo Alto, Calif.

Filed July 10, 1974, Ser. No. 487,406
Int. Cl.² H01J *1/20, 19/14*
U.S. Cl. 313—337 **9 Claims**

1. An electron tube comprising: a cathode, an anode, and at least one grid electrode therebetween; the surface of said cathode facing said grid composed of areas of electron-emissive material alternating with intervening areas of relatively non-emissive material; said grid electrode comprising, a set of conducting bars spaced from said cathode surface and aligned adjacent said non-emissive areas, an array of conducting wires of size and spacing less than said bars, said wires crossing the spacing between adjacent bars and joined electrically and

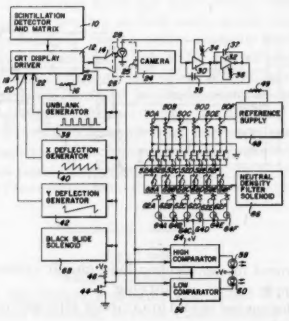


mechanically to the area of said bars facing said cathode surface.

3,917,974
SCINTILLATION CAMERA BRIGHTNESS CALIBRATING APPARATUS

Oreste J. Lucchesi, Bloomingdale, and Donald A. Whiteman, Crystal Lake, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Nov. 23, 1973, Ser. No. 418,229
Int. Cl.² H01J *29/70*
U.S. Cl. 315—30 **19 Claims**

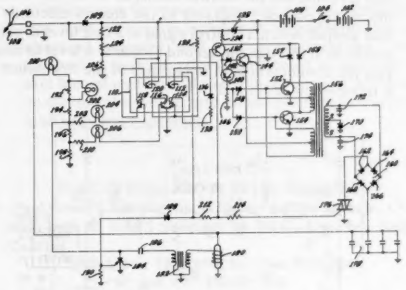


1. Circuitry for calibrating the brightness of a cathode ray tube display and recording apparatus comprising:
intensity control means for adjusting the intensity of the cathode ray tube beam;
light sensitive means disposed to receive light emitted from said cathode ray tube and generating a first electrical signal having a magnitude dependent upon the intensity of said emitted light;
reference signal generating means for generating a second electrical signal of predetermined magnitude; and
electrical signal comparison means coupled to said light sensitive means and said reference signal generating means for comparing the magnitudes of said first and second electrical signals.

3,917,975
STROBE LIGHT

Franz X. Birkner, Newton Highlands, Mass., assignor to Subsea Products, Inc., San Diego, Calif.

Filed Nov. 19, 1973, Ser. No. 417,419
Int. Cl. H05b *37/02*
U.S. Cl. 315—200 R **14 Claims**

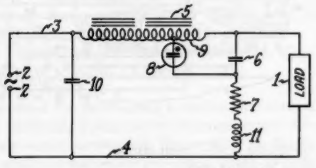


5. A system for providing a two level d-c voltage from an a-c source, including
- a transformer having a secondary winding including a center tap for supplying an a-c voltage,
- a bridge rectifier coupled across the secondary winding for rectifying the a-c voltage through at least a portion of the bridge rectifier to provide an output voltage at an output terminal,
- a diode coupled between the center tap of the secondary winding and a reference potential and
- a switch coupled between the bridge rectifier and the reference potential to provide at the output terminal a first voltage level when the switch is open and to provide at the output terminal a second voltage level higher than the first voltage level when the switch is closed.

3,917,976
STARTING AND OPERATING CIRCUIT FOR GASEOUS DISCHARGE LAMPS

Joe A. Nuckolls, Hendersonville, N.C., assignor to General Electric Company

Continuation-in-part of Ser. No. 674,508, Oct. 11, 1967, abandoned. This application Aug. 26, 1974, Ser. No. 500,631
Int. Cl.² H05B *41/16*
U.S. Cl. 315—258 **9 Claims**

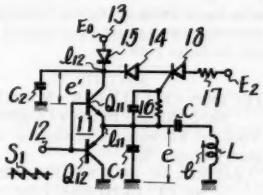


1. A starting and operating circuit for gaseous discharge lamps comprising a source of alternating current, ballasting means connected at its input side to said alternating current source, discharge lamp means connected to the output side of said ballasting means, and high voltage starting means including a portion of said ballasting means connected to said ballasting means at its output side for providing a high voltage starting pulse on said discharge lamp means, said high voltage starting means comprising a charging capacitor and a resistor connected in series across said discharge lamp means, voltage sensitive switch means having a predetermined breakdown voltage connected across said charging capacitor and said portion of said ballasting means and forming a series discharge loop therewith for generating high frequency starting pulses, and induction means connected in series with said charging capacitor and said resistor for providing rapid charging of said charging capacitor and effective impedance to the high frequency starting pulses generated by said series discharge loop.

3,917,977
VERTICAL DEFLECTION CIRCUITS FOR ELECTRON BEAM SCANNING

Masato Izumisawa, Yokosuka, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 26, 1973, Ser. No. 427,649
Claims priority, application Japan, Dec. 28, 1972, 48-1722
Int. Cl.² H01J *29/70, 29/72*
U.S. Cl. 315—395 **9 Claims**



1. A deflection circuit comprising:
- a. a first voltage terminal provided to be connected to a first voltage source;
- b. an output circuit including a pair of transistors connected in a single-ended push-pull amplifier array and a deflection coil connected to the output end of said pair of transistors, means for supplying a sawtooth signal to an input of said push-pull amplifier array, and bias means associated with said push-pull amplifier array to cause said deflection coil to be supplied with a deflection current in trace and retrace periods; said retrace period having a relatively large pulse and said trace period having a ramp shape;
- c. a unidirection element connected between said first voltage terminal and one end of said output circuit;
- d. a second voltage terminal provided to be connected to a second voltage source which is larger than the first voltage source;
- e. gate controlled switch means connected between said second voltage terminal and said one end of the output circuit; and
- f. control means connected to the output of the pair of transistors and to switch means for turning on the switch means in response to the switching of the output of the pair of transistors to the retrace period current.

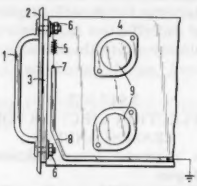
3,917,978
APPARATUS FOR ELIMINATING EFFECTS OF ELECTROSTATIC DISCHARGE

Willi Menzel, Gauting, and Peter Bauer, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 13, 1974, Ser. No. 450,740
Claims priority, application Germany, Mar. 13, 1973, 2312469
Int. Cl.² H05F *3/02*
U.S. Cl. 317—2 R **2 Claims**

1. In electrical equipment having components which will respond to static electricity from an external source and having a discharge path from structural members which might be contacted by an operator or the like receive said static elec-

tricity from said external source, apparatus for controlling, at all times and without requirement for further action, the discharge currents flowing through said discharge path, comprising:

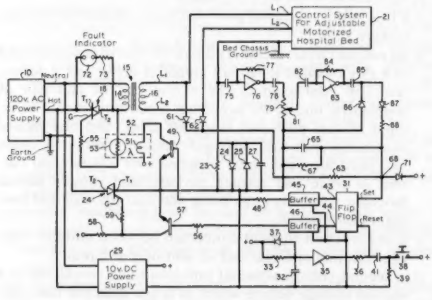


resistance means having a value which will permit the flow of discharge currents having a value up to the changes in the operating current occurring in said equipment, said resistance means being connected between the said structural members which might be contacted by an operator and said discharge path.

3,917,979
PROTECTION CIRCUIT FOR AN ADJUSTABLE MOTORIZED HOSPITAL BED

Joseph A. Volk, Jr., Florissant, Mo., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Mar. 18, 1974, Ser. No. 452,223
Int. Cl.² H02H *3/08, 7/20*
U.S. Cl. 317—18 D **8 Claims**



1. A protection circuit for an adjustable motorized hospital bed wherein a grounded AC power supply is coupled to the bed's electrical control system for applying AC operating voltage thereto, and wherein a ground connection couples the bed chassis to the power supply ground, comprising:

means, including a series-connected resistor in the ground connection, for monitoring any ground leakage current flowing through said ground connection;

switching means responsive to said monitoring means for interrupting the ground connection anytime the ground leakage current exceeds a predetermined threshold level; and a pair of oppositely poled diodes, each connected in shunt with said resistor, for limiting the voltage developed across said resistor.

3,917,980
PROTECTION CIRCUIT

Sherman Weisbrod, Trenton, N.J., assignor to RCA Corporation, New York, N.Y.

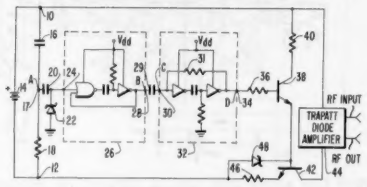
Filed May 20, 1974, Ser. No. 471,555
Int. Cl.² H02H *3/08, 7/20*
U.S. Cl. 317—33 VR **7 Claims**

1. An overcurrent protection circuit for a load having two terminals comprising, in combination:

first and second terminals for an operating voltage, the load being connected at one of its terminals to said first terminal;

a first switch having a control electrode and a conduction path, said conduction path connected between the other terminal of said load and said second terminal;

a second switch having a conduction path and a control electrode, said conduction path connected between said first terminal and the control electrode of the first switch; means for normally applying to the control electrode of said second switch a control signal at a first level to cause conduction through the second switch at a level to maintain the conduction path impedance of the first switch at a relative low level; and

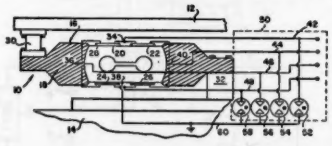


means including a differentiator and also the means set forth above, responsive to a rate of change of current of greater than a given value drawn by said load for maintaining the control signal at the control electrode of said second switch at said first level for a given interval of time, then switching said control signal to a second level for a second interval of time, at which second level the impedance of the conduction path of said second switch is switched to a relatively high impedance level, whereby the impedance of the conduction path of said first switch is switched to a relatively high impedance, then switching said control signal back to said first level.

3,917,981
SCALE LIGHTNING PROTECTION SYSTEM

Harry J. Keen, Waterford, Vt., assignor to Colt Industries Operating Corporation, New York, N.Y.

Continuation of Ser. No. 367,861, June 7, 1973, abandoned, which is a continuation of Ser. No. 257,966, May 30, 1972, abandoned. This application June 4, 1974, Ser. No. 476,327
Int. Cl. H02h *3/22*
U.S. Cl. 317—61.5 **8 Claims**



1. A weighing scale, comprising

a. a scale support unit;

b. a load platform;

c. at least one electrically conductive load responsive member mounted between said scale support unit and said load platform;

d. transducer means for providing a variable electrical characteristic which is a function of the magnitude of a load applied to said load platform, said transducer means including a plurality of strain gauges mounted on said electrically conductive load responsive member;

e. a plurality of electrical transducer leads, each said transducer lead being connected at one end to one of said strain gauges;

f. surge voltage protection means for protecting said strain gauges from surge voltages developed in said transducer leads, said surge voltage protection means including a plurality of protection units corresponding to the number of transducer leads, each unit having a first terminal and a second terminal separated by a high resistance to leakage current and a low resistance to voltage surges, said first terminals being respectively connected to said transducer leads within the confines of said load platform; and

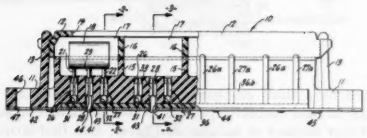
g. lead means for maintaining said second terminals and said load responsive member at substantially the same electrical potential, said lead means including a single conductive lead electrically connected at one end with said second terminals of said protection units and directly connected at the other end to said electrically conductive load responsive member.

3,917,982

ELECTRICAL PROTECTOR ASSEMBLY

E. Paul George, Saratoga, and Robert Nelson Lincoln, Cupertino, both of Calif., assignors to TRW, Inc., Los Angeles, Calif.

Filed Dec. 12, 1974, Ser. No. 532,024
Int. Cl.[2] H02H *1/04*
U.S. Cl. 317—61.5 **7 Claims**



1. In an assembly for holding three-terminal gas-discharge devices for protecting telephone equipment from damage due to lightning or other high voltages on lines connected to the equipment: an insulative housing comprising a base and a cover removably mounted on the base, said housing being formed to include a plurality of sections in which the devices are mounted, contacts mounted in the base in each of the sections for engaging the terminals of the devices, wire receiving terminals connected electrically to two of the contacts in each section and extending externally of the housing for connection to the telephone equipment and lines, and an electrically conductive buss bar member mounted to the base and connected electrically to a third contact in each section.

3,917,983

MULTIWAFER ELECTRICAL CIRCUIT CONSTRUCTION AND METHOD OF MAKING

John Michael Kuronen, Woodland Hills, Calif., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Nov. 12, 1973, Ser. No. 415,102
Int. Cl.[2] H05K *5/00*
U.S. Cl. 317—101 CM **27 Claims**

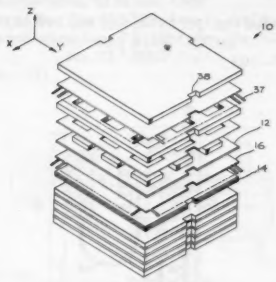
1. A method for fabricating a multiwafer electrical circuit structure including a plurality of pressure-stacked replaceable conductive wafers containing deformable malleable contacts between adjacent wafers for providing wafer-to-wafer connections, the improvement comprising the steps of:

providing each of said wafers from a malleable conductive material,

selectively forming one of the opposed surfaces of one wafer to define a plurality of integral malleable metal contacts projecting from and integral with said one of the opposed surfaces of said one wafer, and

depositing malleable contact areas on an adjacent surface of another wafer with each contact area in registration with a respective one of said integral metal contacts and having a greater area than the respective integral metal contact, and

stacking said one wafer with said other wafer in a stack with each contact area engaging a respective one of said integral contacts under pressure to deform the integral malleable contacts on said one surface of said one wafer to thereby provide reliable wafer-to-wafer electrical connections.

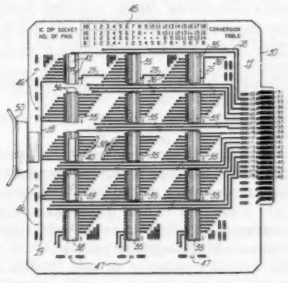


3,917,984

PRINTED CIRCUIT BOARD FOR MOUNTING AND CONNECTING A PLURALITY OF SEMICONDUCTOR DEVICES

George C. Kong, and Elwood J. Carroll, both of Ottawa, Canada, assignors to Microsystems International Limited, Montreal, Canada

Filed Oct. 1, 1974, Ser. No. 511,016
Int. Cl.[2] H05K *1/18*
U.S. Cl. 317—101 CC **4 Claims**



1. A printed circuit board for mounting and connecting a plurality of semiconductor devices, comprising:

a rigid board of electrically insulating material;

a plurality of socket mounting positions on said board, said positions arranged in rows and columns;

each socket position comprising a two parallel rows of contact pads on a top surface of said board and two parallel rows of contact pads on a bottom surface of said board, said contact pads forming corresponding aligned pairs one on said top surface and one on said bottom surface;

at least one plated through hole in each pair of contact pads electrically interconnecting said pair of pads;

a plurality of connector pads adjacent one edge of said board, a connector pad for each pair of contact pads;

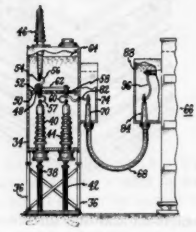
printed circuit means electrically interconnecting a corresponding pair of contact pads at each socket mounting position in parallel and to a selected one of said connector pads;

external contact pads at said one edge of said board, said external contact pads electrically connected with said connector pads in a predetermined pattern.

3,917,985
TRANSFORMER/TRANSMISSION LINE INTERCONNECT SYSTEM

Keith W. Finley, Rome, Ga., assignor to General Electric Company

Filed Oct. 31, 1974, Ser. No. 519,503
Int. Cl.² H02B *5/04, 1/18*
U.S. Cl. 317—103 **4 Claims**



1. An improved electrical connecting means connecting a high voltage underground type power transmission line having a central conductor and terminating in a pothead, said high voltage transmission line and pothead combination having a high degree of rigidity, to an electrical bushing of a fixedly mounted power transformer, wherein the improvement comprises:

a. a junction box mounted in a fixed position, said junction box having,

an aperture receiving therethrough the pothead end of said pothead terminating underground type transmission line;

b. electrical connecting means mounted internal of said junction box to which the central conductor of said underground type power transmission line is electrically connected; and

c. a flexible cable of the underground transmission line type, having a central conductor,

the ends of said flexible cable each terminating in a terminator,

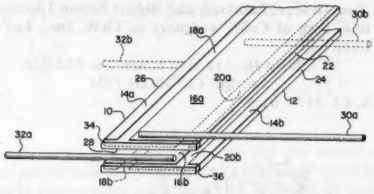
one of said flexible cable terminator ends being demountably attached to said power transformer, the central conductor of said flexible cable being electrically connected to said power transformer bushing, another of said flexible cable terminator ends being demountably attached to said electrical junction box, the central conductor of said flexible cable being electrically connected to said internal connecting means of said electrical junction box.

3,917,986
METALLIZED WOUND CAPACITOR WITH EDGE METALLIZATION

Ronald B. Rice, Fairfax, and John P. Uhl, Arlington, both of Va., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Nov. 1, 1974, Ser. No. 519,959
Int. Cl.² H01G *4/32*
U.S. Cl. 317—260 **2 Claims**

1. A wound capacitor comprising a first elongated initially substantially flat dielectric layer having upper and lower surfaces and a pair of elongated edge surfaces and a second initially substantially flat elongated dielectric layer of approximately the same size as said first layer positioned below said first layer, said second layer also having upper and lower surfaces and a pair of elongated edge surfaces, a first metallized portion of said first dielectric layer extending over a part of the upper surface of said first layer, over a first one of said pair of elongated edges of said first layer and over a part of the lower surface of said first layer, a second metallized portion extending over a part of the upper surface of said first layer over the second one of said pair of elongated edges of said first layer and over a part of the lower surface of said first layer, said first and second metallized portions being electrically isolated by a first elongated strip on said upper surface of said first layer and a second elongated strip on said lower surface of said first layer, a third metallized portion on said second layer extending over a part of the upper surface of said second layer, over a first one of said pair of elongated edges of said second layer which lies below said second one of said elongated edges of said first layer and over a part of the lower surface of said second layer so that the upper surfaces of said first and third metallized portions overlap, a fourth metallized portion extending over a part of the upper surface of said second layer, over the second one of said pair of elongated edges of said second layer and over a part of the lower surface of said second layer so that the lower surfaces of said second and fourth metallized portions overlap, said third and fourth metallized portions of said second layer being electrically

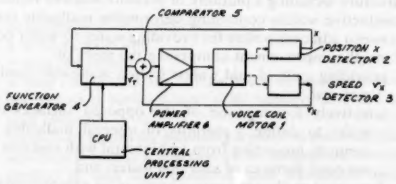


isolated by a third elongated dielectric strip on said upper surface of said second layer and a fourth dielectric strip on said lower surface of said second layer, said first strip being positioned in alignment with said fourth strip adjacent one edge of said dielectric layers and said second strip being positioned in alignment with said third strip adjacent the opposite edge of said dielectric layers, a first electricl lead having a contact portion positioned in contact with said first metallized portion of said first layer on the upper surface thereof and a second elongated electrical lead having a contact portion positioned intermediate said first and second layers so as to contact said second metallized portion of said first dielectric layer on the lower surface thereof and said third metallized portion of said second dielectric layer on the upper surface thereof, said first and second leads being wound about each other so as to form a roll comprising said first and second dielectric layers with the contact portion of said leads being secured in said roll.

3,917,987
VOICE COIL MOTOR CONTROL SYSTEM

Yuji Inoue, Musashino, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 23, 1974, Ser. No. 536,871
Claims priority, application Japan, Dec. 28, 1973, 48-4945
Int. Cl.² G05B *19/28;* **H02K** *41/02*
U.S. Cl. 318—135 **3 Claims**



1. A voice coil motor control system for controlling a voice coil motor for moving an object, the voice coil motor control system comprising

distance means for providing an output signal in accordance with the distance between the actual position of the object and the desired position of the object;

lower curve means for providing a speed signal for the motor indicating the stop point of acceleration in accordance with a lower curve function of the difference means;

upper curve means for providing a speed signal for the motor to follow in accordance with an upper curve function in proportional relation with the lower curve function of the lower curve means; and

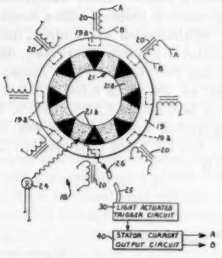
control means for varying the control period of the motor between the lower curve function and the upper curve function in accordance with the output signal of the distance means.

3,917,988

SELECTIVELY VARIABLE TIMING MEANS FOR A BRUSHLESS ELECTRIC MOTOR

James U. Payne, Beatrice, Nebr., assignor to Magna Motor, Inc., Barnes, Kans.

Filed Aug. 7, 1974, Ser. No. 495,266
Int. Cl.² H02K *29/00*
U.S. Cl. 318—138 **4 Claims**



1. A brushless electric motor comprising:

a rotor;

a plurality of permanent magnets symmetrically disposed on said rotor;

a stator comprising a plurality of electromagnets connected in parallel and concentrically located around said rotor;

a light source for producing a light beam directed toward said rotor;

a circular timing band associated with said rotor for intermittently reflecting said light beam to generate a series of light pulses in response to rotation of said rotor, said timing band comprising a plurality of light reflective strips uniform in size and symmetrically disposed on said rotor and separated by nonreflective material, said reflective strips having a circumferential width which varies according to the radial distance from the center of said rotor;

a fiber optic conductor with an input end and an output end for transmission of light pulses therethrough, said input end adjustably positionable both radially outward from and angularly about the center of said timing band;

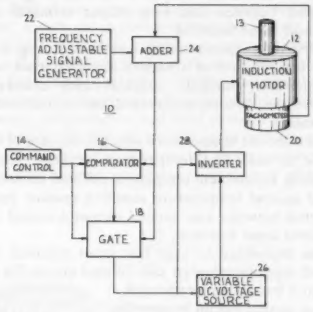
photosensitive means adjacent the output end of said conductor for receiving said light pulses; and stator control means connected to said photosensitive means for simultaneously energizing said electromagnets in response to said light pulses.

3,917,989

DUAL MODE CONTROL OF AN INDUCTION ELECTRIC MOTOR

Jonas Bereisa, Jr., Santa Barbara, Calif., assignor to Aerojet-General Corporation, El Monte, Calif.

Continuation of Ser. No. 432,507, Jan. 11, 1974, abandoned. This application Nov. 22, 1974, Ser. No. 526,382
Int. Cl.² H02P *7/42*
U.S. Cl. 318—231 **5 Claims**



1. A circuit for controlling operation of an electric induction motor, said control circuit comprising:

command signal generating means for providing a cyclic command signal having a frequency representing a desired motor speed;

reference signal means responsive to the induction motor for providing a cyclic reference signal having a frequency representing a speed slightly greater than the operating speed of the induction motor;

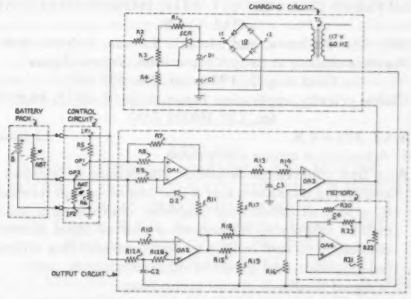
drive signal means responsive to said command and reference signals for providing the induction motor with a drive signal having a frequency corresponding to the lesser of said command and reference signal frequencies.

3,917,990

BATTERY CHARGING CONTROL USING TEMPERATURE DIFFERENTIAL CIRCUIT

Ralph R. Sherman, Jr., Forest, Va., assignor to General Electric Company, Lynchburg, Va.

Filed Apr. 11, 1974, Ser. No. 459,875
Int. Cl.² H02J *7/04*
U.S. Cl. 320—35 **3 Claims**



1. An improved battery charging circuit comprising:

a. a charging circuit having control terminals and output terminals for supplying a relatively high direct current in response to a high control signal applied to said control terminals and for supplying a relatively low direct current

in response to a low control signal applied to said control terminals;

b. a control circuit comprising:

1. first and second input terminals and first and second output terminals;
2. means connecting said first and second input terminals to said charging circuit output terminals;
3. a first resistor of predetermined magnitude connected between said first input terminal and said first output terminal;
4. a second resistor of predetermined magnitude connected between said first output terminal and said second input terminal;
5. a first temperature sensitive resistor arranged to sense the temperature of a battery being charged, said first temperature sensitive resistor being connected between said first input terminal and said second output terminal;
6. and a second temperature sensitive resistor of the same type as said first temperature sensitive resistor for sensing the ambient temperature of said control circuit, said second temperature sensitive resistor being connected between said second output terminal and said second input terminal;

c. means connected to said first input terminal and said second input terminal of said control circuit for connection to a battery to be charged;

d. and an output circuit comprising:

1. input terminals and output terminals;
2. means connecting said output circuit input terminals to said control circuit output terminals for producing a high control signal at said output circuit output terminals in response to said battery temperature being within a predetermined region relative to said ambient temperature, for producing a low control signal at said output circuit output terminals in response to said battery temperature being above said predetermined region, and for producing a low control signal at said output circuit output terminals in response to said battery temperature being below said predetermined region;
3. and means connecting said output circuit output terminals to said charging circuit control terminals.

3,917,991

DIFFERENTIAL CIRCUIT WITH IMPROVED SIGNAL BALANCE

Yoshio Ota, Fujisawa, and Masashi Takeda, Isehara, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 8, 1974, Ser. No. 495,930
Claims priority, application Japan, Aug. 10, 1973, 48-90216
Int. Cl.[2] H02M *7/00*
U.S. Cl. 321—8 R **12 Claims**

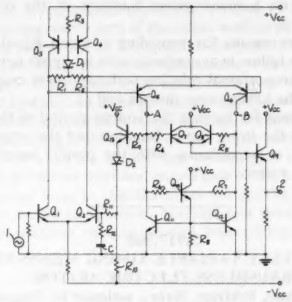
1. A transistor circuit comprising:

A. a first differential amplifier comprising a first pair of amplifying transistors and a first pair of output terminals;

B. a second differential amplifier comprising a second pair of amplifying transistors, a pair of input terminals connected to said output terminals of said first differential amplifier, and a pair of output terminals; and

C. a signal feedback circuit comprising:

1. a transistor connected as an emitter-follower having an input electrode connected to one of said output terminals of said second differential amplifier and an output electrode, and
2. an output circuit including a diode connected in series between said transistor output electrode and an input terminal of said first differential amplifier to supply a signal received from said transistor output electrode to



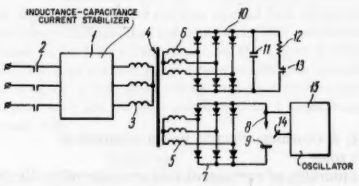
said first differential amplifier in opposite polarity to the signal amplified thereby.

3,917,992

SOURCE OF POWER SUPPLY OF PLASMATRON ARC

Igor Vladimirovich Volkov, ulitsa Saxaganskogo, 90, kv. 112; Eduard Migranovich Esibian, ulitsa Kapitanovskaya, 6, kv. 47; Mikhail Mikhailovich Alexandrov, ulitsa Bratskaya, 10, kv. 28; Stanislav Ivanovich Zakrevsky, ulitsa Vernadskogo, 61, kv. 92, and Petr Grigorievich Zhukovsky, ulitsa Parkhomenko, 60, kv. 49, all of Kiev, U.S.S.R.

Continuation of Ser. No. 305,185, Nov. 9, 1972, abandoned.
This application Apr. 18, 1974, Ser. No. 462,091
Int. Cl. G05f *1/02;* **H01j** *7/24*
U.S. Cl. 323—6 **4 Claims**

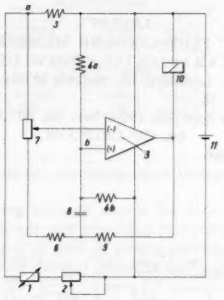


1. A power supply source for supplying a plasmatron arc in a cathode-article arc gap with stabilized current, said power supply being operative from a three-phase supply line and comprising an inductive-capacitance stabilizer including output terminals connected to the three phases of said supply line, said stabilizer further including input terminals, a transformer including a primary winding connected to the input terminals of said stabilizer, said transformer also including first and second secondary windings, first and second rectifiers including input terminals connected to respective of the secondary windings of said transformer and further including output terminals, the output terminals of said first rectifier being connected across the cathode-article arc gap for supplying the plasmatron with current, and a capacitor, the output terminals of the second rectifier being connected to said capacitor such that the arc current increases smoothly as the capacitor is charged, said rectifiers being isolated from each other in a D.C. sense, said capacitor being isolated from said first rectifier in a D.C. sense.

3,917,993
BISTABLE REGULATOR HAVING POSITIVE AND NEGATIVE FEEDBACK

Ernst Picmaus, and Bernhard Bach, both of Frankenthal, Pfalz, Germany, assignors to Klein. Schanzlin & Becker Aktiengesellschaft, Germany

Filed Oct. 26, 1973, Ser. No. 410,224
Claims priority, application Germany, Oct. 31, 1972, 2253373
Int. Cl.[2] G05B *11/16*
U.S. Cl. 323—75 N **6 Claims**



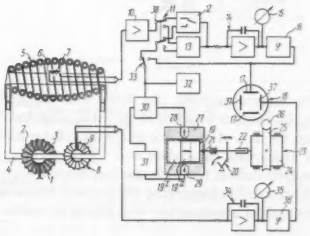
1. A regulator circuit, comprising, in combination, operational amplifier means having a direct and an inverting input and an operational amplifier output; and feedback circuit means connected between said operational amplifier output and said inverting input for furnishing a delayed negative feedback and connected between said operational amplifier output and said direct input for furnishing a positive feedback, said feedback circuit means connected between said operational amplifier output and said direct input including a differentiator circuit; further comprising a power supply having a first and second voltage terminal; and wherein said feedback circuit means comprise a voltage divider having a first divider end terminal connected to said operational amplifier output, a second divider end terminal, and a first and second voltage divider tap, a variable impedance having an impedance varying as a function of the actual value of a quantity to be controlled connected between said second voltage terminal and said second terminal, means for connecting said second divider end terminal to said first voltage terminal, means for directly connecting said inverting input to said first voltage divider tap, a capacitor, means for interconnecting said capacitor between said second voltage divider tap and said direct input of said operational amplifier, and a resistor connected from said direct input to said second voltage terminal, whereby said capacitor and said resistor together constitute said differentiator circuit.

3,917,994
OSCILLOGRAPHIC FERROMETER

Vitaly Moritsovich Mogilevsky, ulitsa O. Zhilinoi 92-b; Vadim Petrovich Ekimov, ulitsa Schetinkina, 48, kv. 33, and Eduard Alexeevich Abrosimov, Narymskaya, 9, kv. 44, all of Novosibirsk, U.S.S.R.

Filed Oct. 10, 1974, Ser. No. 513,943
Int. Cl.[2] G01R *33/12*
U.S. Cl. 324—34 R **4 Claims**

1. An oscillographic ferrometer comprising: a magnetizing means; a magnetization measurement channel cooperating with said magnetizing means; a magnetizing field measurement channel cooperating with said magnetizing means; a storage means connected to said measurement channels; said magnetizing means comprising: a step-down transformer, a single-turn secondary winding of said step-down transformer, a solenoid connected to said secondary winding and producing a homogeneous magnetic field in which a test sample is placed; said magnetization measurement channel comprising: a magnetization pick-up means arranged within the homogeneous magnetic field produced by said solenoid, a switch connected to said magnetization pick-up means, a switching means connected to said switch, a differential amplifier having inputs and an output, one input of said differential amplifier being connectded to said magnetization pick-up means, via said switch a first integrator connected to the output of said differential amplifier and to the output of said switching means, a first phase corrector seriesly connected to said first integrator; a cathode-ray tube connected to said first phase corrector; said magnetizing field measurement channel comprising: a field strength pick-up means inductively coupled with the field of the secondary winding, a second integrator having an input and an output, said input of said second integrator being connected to said field strength pick-up means, a second phase corrector having an input and an output, said input of said second phase corrector being connected to the output of said second integrator, said output of said phase



corrector being connected to said cathode-ray tube; said storage means being connected to said switch and comprising: a magnetic drum carrying a record of the preset signal representing the standard sample magnetization, a housing of said magnetic drum, a synchronous electric motor rotating said magnetic drum and being fed with the supply voltage having the same frequency as that of said magnetizing means, a frame of said synchronous electric motor, a first reproduce magnetic head accommodated in said magnetic drum housing at a distance from said magnetic drum sufficient to reproduce the recorded signal, a second reproduce magnetic head accommodated in said magnetic drum housing at a distance from said magnetic drum sufficient for reproducing the recorded signal and diametrically opposite to said first magnetic head, an adder having two inputs and an output, said adder having its first input connected to said first magnetic head, a level regulator having an input and an output, said level regulator having its input connected to the second magnetic head and its output connected to the second input of said adder, said adder having its output connected to said magnetization measurement channel switch.

3,917,995
MOVABLE BRUSH ASSEMBLY FOR MAKING ELECTRICAL CONTACT WITH THE OUTER SURFACE OF AN ELECTRICAL CABLE

Henry H. Clinton, R.F.D. No. 1, Ivoryton, Conn. 06442

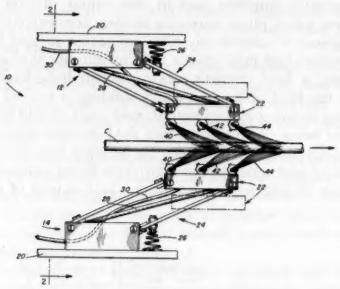
Filed Aug. 26, 1974, Ser. No. 500,456
Int. Cl.[2] G01R *31/12*
U.S. Cl. 324—54 **8 Claims**

1. Apparatus for making electrical contact with the outer surface of an electrical cable moved axially of itself comprising:

a brush assembly having a plurality of electrically conductive contact brushes which are located in serially adjacent relationship along a line parallel with the axis of the cable

and which are brought into physical engagement with the outer surface of the cable;

a movable mechanical support holding the brush assembly for movement toward and away from physical engagement with the cable and maintaining a substantially fixed angular relationship of the brush assembly and the cable, the mechanical support including a pantograph linkage having two parallel links of the same length and a bar



pivotally interconnecting the links and supporting the plurality of contact brushes at the fixed angular relationship with the axis of the cable and with substantially equal contact areas with the cable; and

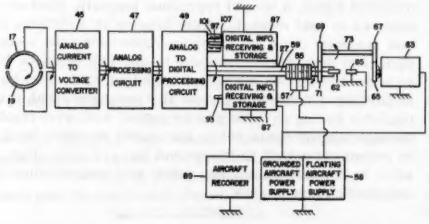
resilient means connected with the mechanical support and the brush assembly for urging the contact brush assembly toward physical engagement with the outer surface of the cable.

3,917,996

ELECTRIC FIELD MEASURING DEVICE

Peter B. Wagner; James W. Telford, and Richard W. Hanaway, all of Reno, Nev., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 5, 1974, Ser. No. 486,035
Int. Cl.[2] G01R *31/02*
U.S. Cl. 324—72 **3 Claims**


ANALOG CURRENT TO VOLTAGE CONVERTER
ANALOG PROCESSING CIRCUIT
ANALOG TO DIGITAL PROCESSING CIRCUIT
DIGITAL INFO. RECEIVING & STORAGE
DIGITAL INFO. RECEIVING & STORAGE
AIRCRAFT RECORDER
GROUNDED AIRCRAFT POWER SUPPLY
FLOATING AIRCRAFT POWER SUPPLY

1. An electric field measuring device comprising:

a. a rotatable assembly;

b. a stationary assembly;

c. said rotatable assembly including means for providing an electrical signal that contains information defining a condition;

d. said electrical signal being operably connected to an optical transmitter;

e. said optical transmitter being operably connected to said rotatable assembly;

f. an optical receiver being operably connected to said stationary assembly and positioned to provide an optical coupling with the optical signal from said optical transmitter;

g. said rotatable assembly including a sleeve made of dielectric material;

h. said means includes first and second capacitor plates and signal processing means;

i. said first and second capacitor plates being spaced apart and operably connected to said sleeve;

j. said first and second capacitor plates being operably connected to the input of said signal processing means; and

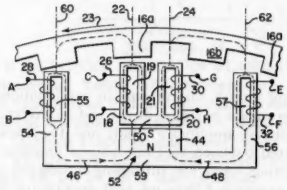
k. the output of said signal processing means being operably connected to the input of said optical transmitter.

3,917,997

MAGNETIC FLUX CLOSURE MEMBER FOR AN ANGULAR VELOCITY SENSING DEVICE

Edward F. Sidor, Lombard, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Sept. 20, 1974, Ser. No. 507,828
Int. Cl.[2] G01P *3/48*
U.S. Cl. 324—166 **1 Claim**

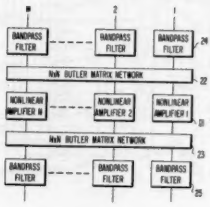


1. In a velocity sensing device for sensing the velocity of a rotating member having a plurality of projections of substantially equal width separated by spaces of substantially equal width on its periphery with said projections being capable of conducting magnetic flux to create a time-varying magnetic field comprising a four-arm, four-terminal active bridge circuit sensing means that comprises a pair of magnetic cores positioned adjacent the periphery of said rotating member, a first winding on one of said cores, a second winding on the other of said cores, third and fourth windings which are interconnected with each other and with said first and said second windings to form said bridge circuit, the center line of a first one of said cores being aligned with the center line of a first one of said projections when the center line of the second one of said cores is approximately aligned with the center line of the space between said first one of said projections and the next adjacent projection, and excitation generator means coupled to supply a carrier signal across two terminals of said bridge circuit, so as to provide an output signal across the other two terminals of said bridge circuit; the improvement comprising a magnetically permeable flux closure member positioned adjacent said cores and having first and second legs and a section that joins said legs, said first leg having a first aperture therein and said second leg having a second aperture therein constructed so as to receive said third winding through said first aperture and said fourth winding through said second aperture and so that the center lines of said legs are spaced such that the center line of said first leg is aligned with the center line of the projection that precedes said first one of said projections when the center line of said second leg is approximately aligned with the center line of the space that succeeds said space between said first one of said projections and said next adjacent projection.

3,917,998
BUTLER MATRIX TRANSPONDER

George R. Welti, Leesburg, Va., assignor to Communications Satellite Corporation, Washington, D.C.

Filed Nov. 2, 1973, Ser. No. 412,399
Int. Cl. H04b 1/59
U.S. Cl. 325—3 10 Claims



1. A multichannel communications transponder, comprising;

a. first phasing network means for receiving M distinct channel signals and providing N output signals where $M \leq N$, each of said N output signals consisting of a sum of all M distinct phase shifted signals divided by $\sqrt{N}$;

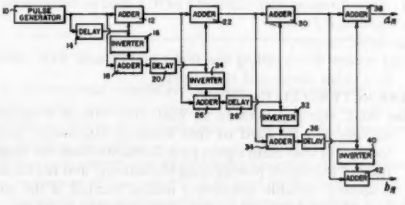
b. N nonlinear amplifier means connected to receive and amplify said N output signals from said first phasing network means; and

c. second phasing network means identical to said first phasing network means and connected in mirror image fashion to receive the amplified N output signals and providing M distinct channel output signals corresponding to the originally received M distinct channel signals.

3,917,999
MULTIPLEXED PSEUDO NOISE PULSE BURST CODES WITH SPACE TAPER

Frank S. Gutleber, 24 Carriage House Lane, Little Silver, N.J. 07739

Filed June 18, 1974, Ser. No. 480,451
Int. Cl.² H04B 7/02
U.S. Cl. 325—40 5 Claims

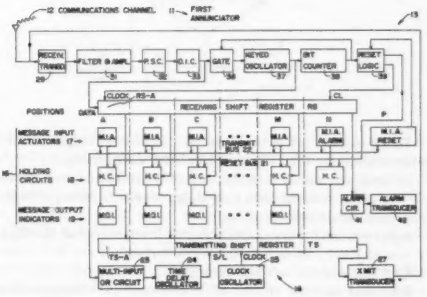


1. A pulse doppler frequency signalling system for generating a code mate pair of asymmetrically interleaved code bits for transmission and for reception after undergoing a doppler frequency shift which provides for code compression to a lobeless impulse function in the time domain and for controllable minimization of lobes in the frequency domain of the ambiguity diagram comprising a pulse generator for providing a single input pulse, and a code pair expander responsive to said input pulse and including a plurality of *m* cascaded code pair expansion circuits each doubling the number of code bits and thereby forming a new code mate pair, each of said code expansion circuits having circuit means for delaying the code bits of one of said previous code mate pairs and for adding the delayed previous code mate pair with the undelayed previous code mate pair to form a first expanded code, and each of said code expansion circuits having circuit element means for delaying and for inverting one of said previous code mate pairs and for adding the inverted delayed previous code mate pair to the undelayed previous code mate pair to form a second expanded code, the delay introduced into the delaying means of a given xth one of the m circuit means and circuit element means is given by $\frac{1}{2}f_d$ where f_d is the selected frequency of the xth null in the frequency domain.

3,918,000
ANNUNCIATOR SYSTEM COMMUNICATING VIA A MINIMUM AVAILABLE COMMUNICATION CHANNEL

Victor Y. Lain, Santa Clara, and Werner Yee, San Mateo, both of Calif., assignors to Signacom Systems, Inc., Redwood City, Calif.

Filed Aug. 16, 1973, Ser. No. 388,895
Int. Cl.² H04B 1/00
U.S. Cl. 325—64 1 Claim



1. In a minimum communications channel annunciator of the type utilizing transmit and receiver transducers the system comprising,

a first digital signal processor including a shift register having plural bit storage locations and an output for serially shifting a corresponding single message defined by a predetermined number of serial bits, plural manually operated load switch inputs connected to said register for parallel loading said locations, a time delay oscillator including a triggered mono-stable oscillator responsive to said load inputs for causing said register after a predetermined time delay to serial shift said stored message output to modulate the transmit transducer to the communications channel,

a transmit transducer modulated by said first transducer and coupled to the communications channel,

a receiver transducer coupling the input of a second signal processor to the communications channel,

and a second digital signal processor including a second shift register serially responsive to the serial shift of said first register to receive said serial bits, including a bit counter for counting said predetermined number of bits, and including a gate responsive to said bit counter for discontinuing said bits to said second shift register and said register having parallel read out and having plural message output indicators responsive to each of said respective manual switch inputs.

3,918,001
APPARATUS FOR PRODUCING TWO HILBERT TRANSFORM RELATED SIGNALS

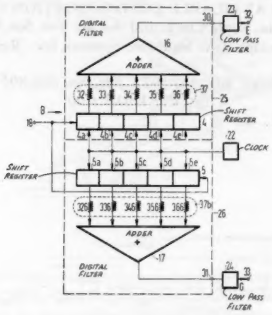
Heinrich Sailer; Norbert Schatz, both of Munich, and Gero Schollmeier, Gauting, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed June 18, 1973, Ser. No. 370,700

Claims priority, application Germany, June 22, 1972, 2230597

Int. Cl.² H04B *1/68*

U.S. Cl. 325—137 **7 Claims**



1. Apparatus for generating two signals having a relationship defined by the Hilbert Transform comprising:

at least one series combination of a predetermined number of delay means, each said delay means forming a stage of said series combination,

input means for receiving a digital input signal at the first of said stages in said series combination,

first and second adding means,

first and second groups of coefficient producing components, each said group being constituted by a number of said components equal to said predetermined number, said components of said first and second groups connecting, respectively, said stages to inputs of said first and second adding means,

each said group having components of differing conductance values, but said groups having corresponding components of like values, the values of said components being determined so that said two signals have, respectively, +45° and −45° phases relative to said input signal, said components in said groups having like components connected to said stages in opposite sequences of values relative to the direction of transmission of said input signal through said series combination of delay elements and

first and second output means from said first and second adding means from which are emitted two output signals having a relationship to each other defined by the Hilbert Transform.

3,918,002
ELECTRONIC CHANNEL SELECTOR SYSTEM WITH PRESET-AT-POWER-ON FEATURE

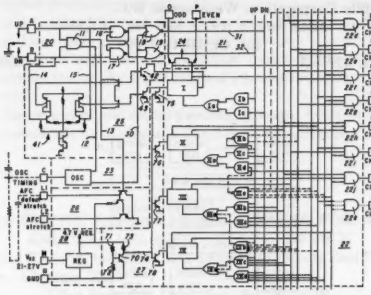
Horst Leuschner, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 22, 1974, Ser. No. 472,312

Int. Cl.² H03J *1/00*

U.S. Cl. 328—48 **11 Claims**

1. An electronic channel selector system for television receivers of the type wherein an electronic multistage counter provides a scanning action to activate each of the selectable broadcast channels individually and periodically in sequence in dependence on the count registered by said counter, said selector system including a means to produce a preselected



count in said counter each time operating power is intially applied to said selector system.

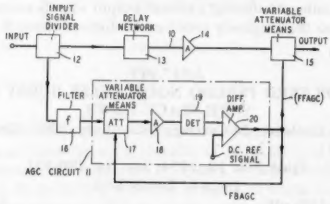
3,918,003
COMBINED FEEDBACK AND FEEDFORWARD AUTOMATIC GAIN CONTROL

Harold Seidel, Warren, N.J., assignor to Bell Telephone Laboratories, Inc., Murray Hill, N.J.

Filed Oct. 29, 1974, Ser. No. 518,510

Int. Cl.² H03G *3/30*

U.S. Cl. 330—29 **15 Claims**



1. An automatic gain control (AGC) system comprising:

a main signal path;

an AGC circuit;

and means for coupling the input end of said AGC circuit to a point along said signal path;

CHARACTERIZED IN THAT:

the AGC signal generated by said AGC circuit is simultaneously fed forward to first variable attenuator means located in said main signal path for controlling the magnitude of the signal propagating therealong, and fed back to a second variable attenuator means located at the input end of said AGC circuit for controlling the magnitude of the signal in the AGC circuit.

3,918,004
DIFFERENTIAL AMPLIFIER CIRCUIT

Ikuo Shimizu; Hiroshi Furuno, and Ryuji Oki, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sept. 9, 1974, Ser. No. 504,291

Claims priority, application Japan, Sept. 11, 1973, 48-106381

Int. Cl.² H03F *3/45*

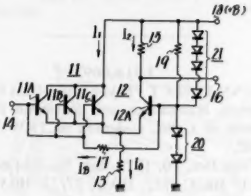
U.S. Cl. 330—30 D **5 Claims**

1. A balanced differential amplifier circuit comprising:

A. a first section comprising first transistor means having base, emitter and collector electrodes;

B. a second section differentially-connected with respect to said first section and comprising second transistor means having base, emitter and collector electrodes, the effective emitter junction area of one of said first and second transistor means being larger than the effective emitter junction area of the other transistor means by a factor n;

C. means for applying bias potentials to the base electrodes of said transistor means; and



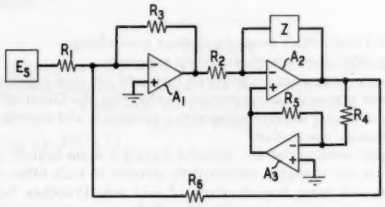
D. a resistor connected between base electrodes of said transistor means of said first and second sections, said resistor having a resistance value which is a function of said factor n, so that the current flowing through said first section is equal to the current flowing through said second section in the absence of an input signal applied thereto.

3,918,005

OPERATIONAL AMPLIFIER CIRCUITRY WITH AUTOMATIC SELF-BIASING FOR ENHANCED VOLTAGE COMPLIANCE

Stanley Bruckenstein, Amherst, N.Y., and Barry Miller, Murray Hill, N.J., assignors to Bell Telephone Laboratories, Inc., Murray Hill, N.J.

Filed July 24, 1974, Ser. No. 491,344
Int. Cl.[2] H03F *1/24*
U.S. Cl. 330—99 **7 Claims**



1. Operational amplifier circuitry for maintaining a controlled signal level at a variable, floating load impedance with an enhanced voltage compliance across the load impedance, the circuitry including:

a first operational amplifier having inverting and noninverting inputs and an output, said load impedance having one terminal which is responsive to signal variations from said first operational amplifier output and another terminal which is responsive to signal variations at said inverting input of said first operational amplifier,

means for supplying a variable control voltage signal,

a second operational amplifier having inverting and noninverting inputs and an output, said noninverting input being maintained at a reference ground potential,

a first resistor serially connecting said variable control voltage signal supply means to said second operational amplifier inverting input,

means for coupling a portion of said output from said second operational amplifier back to its inverting input,

a second resistor serially connecting said second operational amplifier output to said first operational amplifier inverting input,

inverting circuitry for coupling an inverted variable signal reference from the output of said first operational amplifier back to its noninverting input, and

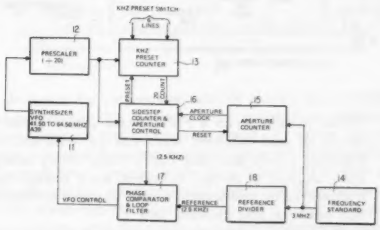
means for coupling a portion of the output signal from said first operational amplifier back to said second operational amplifier inverting input.

3,918,006

DIGITAL FREQUENCY SYNTHESIZER INCLUDING PHASE LOCKED LOOP

Clement W. Munninghoff, and Francis A. Wissel, both of Milford, Ohio, assignors to Cincinnati Electronics Corporation, Cincinnati, Ohio

Filed Sept. 27, 1974, Ser. No. 509,955
Int. Cl.[2] H03B *3/04*
U.S. Cl. 331—1 A **14 Claims**



10. A digital frequency synthesizer for deriving a predetermined one of a plurality of frequency channels within a frequency band, said synthesizer being capable of covering a number of said bands, comprising a voltage controlled oscillator settable to said bands, means for activating the oscillator so that it has an output frequency in a selected one of said bands, said oscillator being voltage controlled within each of said bands, frequency divider means responsive to the oscillator frequency for frequency dividing the oscillator frequency and for deriving frequency divided output pulses having occurrence times determined by the selected channel, the spacing between adjacent ones of said output pulses being equal to the time required for the oscillator to derive a number of cycles equal to the frequency spread of each of said bands, means for gating only the output pulse having an occurrence time correlated with the preselected band, means for deriving a control voltage for the oscillator frequency in response to the time position of the gated output pulse, and means for controlling the oscillator frequency to the selected channel within the selected band in response to the control voltage.

3,918,007

FABRY-PEROT POLARIZATION LASER BEAM MODULATOR

Armand Lucien Waksberg, Dollard-Des-Ormeaux, Quebec, Canada, assignor to RCA Corporation, New York, N.Y.

Filed Mar. 25, 1974, Ser. No. 454,157
Int. Cl.[2] H01S *3/10*
U.S. Cl. 331—94.5 M **11 Claims**

1. Apparatus for generating a polarization modulated laser beam of coherent wave energy; said apparatus comprising:

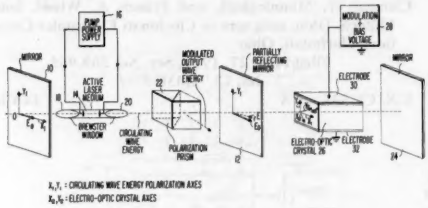
a. first and second spaced mirrors, at least said second mirror being partially reflecting and partially transmissive, said first and second mirrors being positioned with respect to each other to define therebetween an optical resonant cavity at the wavelength of said coherent wave energy;

b. means including an active laser medium situated within said optical resonant cavity for generating said coherent wave energy in response to a pump source being coupled to said active lasing medium;

c. polarizer means situated within said optical resonant cavity for retaining within said optical resonant cavity only that component of said coherent wave energy incident thereon which has a given polarization and for ejecting from said optical resonant cavity that component of said coherent wave energy incident thereon which as a polarization in quadrature with said given polarization;

d. a third mirror situated outside of said optical resonant cavity in spaced relationship with said second mirror to define therebetween a Fabry-Perot cavity at the wavelength of said coherent wave energy, with said optical resonant cavity and said Fabry-Perot cavity being optically aligned to permit coherent wave energy partially transmitted by said second mirror to move in either direction between said cavities, and

e. polarization-rotating means situated in said Fabry-Perot cavity for rotating the polarization of coherent wave energy incident thereon in accordance with a modulating signal applied to said polarization-rotating means.



3,918,008

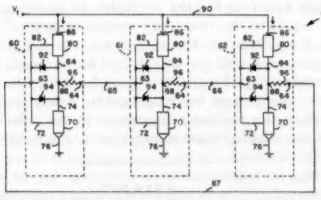
VOLTAGE CONTROLLED SWEEP OSCILLATOR

Charles A. Walton, Los Gatos, Calif., assignor to Proximity Devices, Inc., Sunnyvale, Calif.

Division of Ser. No. 319,038, Dec. 27, 1972, Pat. No. 3,831,112. This application July 15, 1974, Ser. No. 488,716

Int. Cl.[2] H03B *5/24*

U.S. Cl. 331—108 B **4 Claims**



1. A sweep oscillator comprising, in combination:

a first terminal means for receiving a variable control potential;

a plurality of individual amplifier-phase shift stages connected in cascade in which the amplification gain of each stage is at least unity, each of said stages being adapted to amplify an input signal and generate an output signal $(180° + \alpha)$ out of phase relative to the input to said stage wherein α represents a phase shift induced by the internal characteristics of said stage, each of said stages including an amplifier transistor of which the internal reactance varies responsive to current therethrough, each of said amplifier transistors having a base, a collector and an emitter electrode, the base electrode of each amplifier transistor extending to the output of the preceding stage and one end of the collector-emitter circuit of each amplifier transistor extending to a potential reference, each stage further including a current control transistor with the collector-emitter circuit of the current-control transistor joined in series to the terminal means and the other end of the emitter-collector circuit of the amplifier transistor, the base of said current control transistor being joined to the base of the amplifier transistor, and a unidirectional conducting element between the base and collector of the current control transistor; and

feedback means for returning an output signal from the last stage of the cascade to the input of the first stage of the cascade.

3,918,009

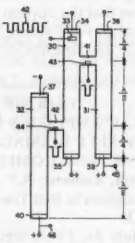
GUNN EFFECT PHASE MODULATOR

Dale H. Claxton, Hawthorne, and Raymond P. Liccini, Los Angeles, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Dec. 20, 1974, Ser. No. 534,602

Int. Cl.[2] H03C *3/22*; **H03K** *17/72*; **H03B** *7/14*

U.S. Cl. 332—9 T **7 Claims**



1. A Gunn effect phase modulator comprising:

a. a substrate of semi-insulating material;

b. a semiconductive material disposed on said substrate, said semiconducting material exhibiting the Gunn effect and having differential negative resistance and capable of domain nucleation;

c. said semiconductive material having a main branch and two side branches substantially parallel to each other and to said main branch, each of said side branches being connected to said main branch by an interconnecting portion;

d. each of said three branches having two ohmic electrodes;

e. means for biasing said ohmic electrodes to provide a cathode and an anode and to create an electric field in said semiconduction material below the threshold field where domain nucleation begins;

f. a Schottky barrier electrode disposed near the cathode of said main branch and a Schottky barrier electrode on each of said interconnecting portions;

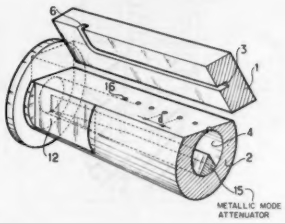
g. means for applying an input trigger pulse to said Schottky electrode of said main branch having a magnitude sufficient together with said electric field to initiate domain nucleation whereby a dipole domain is formed in said main branch;

h. means for applying a gating pulse to a selected one of the Schottky electrode of said interconnecting portions whereby the launched dipole domain will either propagate in one or the other of said side branches, said side branches having each a predetermined length with respect to the length of said main branch, whereby an output pulse may be obtained at the anode of one of said side branches having a predetermined phase relationship with the input pulse.

3,918,010
OPTIMIZED RECTANGULAR WAVE GUIDE TO CIRCULAR WAVE GUIDE COUPLER

Jean-Noël Marchalot, Paris, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Nov. 14, 1974, Ser. No. 523,950
Claims priority, application France, Nov. 28, 1973, 73.42357
Int. Cl.² H01P *5/08, 1/16*
U.S. Cl. 333—10 **3 Claims**

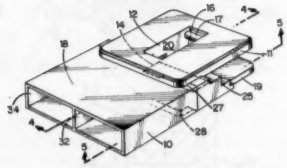


1. In an optimized rectangular wave guide to circular wave guide coupler set parallel to each other and one on top of another and including coupling holes within the rectangular wave guide on a generatrix of the circular wave guide, said coupling holes being arranged on either side of the middle of the length of the circular wave guide over a part of the length of that guide, the improvement wherein: said circular wave guide comprises, a metallic tongue whose cross-section opposite the coupling holes is a constant arc and full sector portion whose arc is diametrically opposite to the said coupling holes and whose cross-section outside the coupling holes is a sector portion progressively reduced to a fine line ridge at the ends of the circular wave guide, with said tongue attenuating propagation modes other than TE_{01} or TE_{02} in the circular wave guide.

3,918,011
BROADBAND FOLDED H-PLANE ORTHOGONAL TEE

Edward Salzberg, 19 Black Oak Rd., Wayland, Mass. 01778

Filed Aug. 26, 1974, Ser. No. 500,452
Int. Cl.² H01P *5/20*
U.S. Cl. 333—11 **7 Claims**



1. A broadband H-plane folded hybrid tee comprising:

a. two main arms folded so as to share a common narrow wall and having a wide dimension and a narrow dimension;

b. an E-plane arm sharing a substantially common axis with an H-plane arm, said common axis being perpendicular to a plane parallel to said wide dimension and bisecting both main arms;

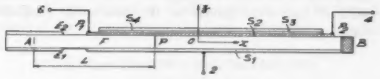
c. a common region common to all arms having a wide dimension facing the wide dimension of said main arms, a narrow dimension facing the narrow dimension of said main arms; and,

d. a termination of said common region formed by a substantially continuous sloping solid wall directly connecting a narrow wall of said E-plane arm with a wide wall of said H-plane arm on the side opposite the conjunction with the main arms, said solid wall being discontinuous only to the extent of integrally cast matching structure.

3,918,012
METHOD AND DEVICE FOR PROVIDING A VARIABLE DELAY LINE

Jean Claude Peuzin, Eybens, France, assignor to Commissariat a l'Energie Atomique, Paris and Agence Nationale de Valorisation de la Recherche Anvar, Neuilly-sur-Seine, both of, France

Filed July 29, 1974, Ser. No. 492,856
Claims priority, application France, Aug. 3, 1973, 73.28443
Int. Cl.² H03H *9/26, 9/30, 9/32*
U.S. Cl. 333—30 R **13 Claims**

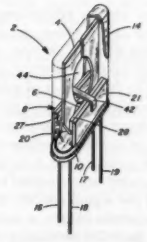


1. A device for varying the delay of a delay line comprising an elongated bar (F) of ferroelectric material of substantially uniform cross-section and having a wall (P) where the piezoelectric constant is discontinuously disposed in the path of a wave propagated longitudinally in said bar and further comprising means for producing and regulating the position of a wall (P) where the piezoelectric constant is discontinuous, the wall coinciding with the position of a flat equipotential surface oriented transversely of the bar, the device being characterised in that said elongated bar made of a ferroelectric material is provided with first and second polarizing electrodes on opposite sides of the bar with respect to a polarity direction transverse of said bar, said electrodes respectively being a first electrode (S_1) made of a conductive material and a second electrode (S_2) made of resistive material, and in that a d.c. voltage (V_c) is applied to said first electrode (S_1) and d.c. voltages $+V_p$ and $-V_p$ are applied to the two longitudinally spaced ends (P_1 and P_2) of said second electrode (S_2) so that $-V_p < V_c < V_p$.

3,918,013
FILTER DEVICE

Antonio Lungo, 7076 Big Creek Parkway, Middleburg Heights, Ohio 44130

Filed Apr. 8, 1974, Ser. No. 458,712
Int. Cl.² H03H *9/04, 9/06, 9/16;* **H01L** *41/04*
U.S. Cl. 333—72 **27 Claims**



1. A piezoelectric ceramic resonator of the slotted-plate type for use in a filter assembly comprising,

a unitary, generally flat, symmetrically-shaped body made of piezoelectric ceramic material and defined by an outer peripheral edge,

said body includes an opening having one portion disposed inwardly of said peripheral edge and a slot portion which

extends to said peripheral edge defining a pair of laterally extending arms,

said arms are integrally connected to one another at one of their ends by a connecting portion of said body and are spaced apart from one another at their opposite ends to enable vibration thereof,

said body includes spaced mounting regions disposed adjacent said connected ends of said arms and being separated by said connecting portion for mounting said resonator in a filter assembly,

electrode means on said body adjacent said mounting regions for electrical contact of said resonator in a filter assembly, and

said body is of one transverse width dimension across said mounting regions and of a reduced transverse width across said connecting portion as measured in a transverse direction between said one portion of said opening and said outer peripheral edge of said body whereby the compliance of said resonator is confined by limiting the shift of its nodal points as the resonator frequency is tuned to different frequencies.

3,918,014

GYRATOR RESONANT CIRCUIT HAVING REGULATION OF SUPPLY CURRENT

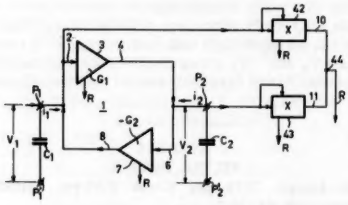
Johannes Otto Voorman, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed July 17, 1974, Ser. No. 489,371

Claims priority, application Netherlands, July 23, 1973, 7310197

Int. Cl.² H03H *5/12, 11/00*

U.S. Cl. 334—14 **2 Claims**



1. A gyrator resonant circuit comprising: a first voltage controlled current source of positive transconductance and a second voltage-controlled current source of negative transconductance, the input of said first voltage-controlled current source being connected to the output of said second voltage-controlled current source to form a first gyrator gate and the input of said second voltage controlled current source being connected to the output of said first voltage controlled current source to form a second gyrator gate; a capacitance terminating each gate; a first squaring unit coupled to the first gate for producing the square of the signal applied to the input of said first voltage controlled current source, a second squaring unit coupled to the second gate for producing the square of the signal applied to the input of said second voltage controlled current source; a summing device connected to the outputs of said first and second squaring unit to produce the sum of the squared signals; and a plurality of signal dependent supply current sources for setting the direct currents flowing through the two voltage controlled current sources, each of said supply current sources having a control input connected to the output of said summing device.

3,918,015

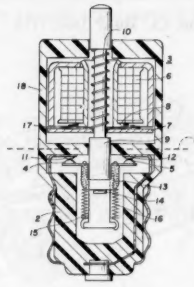
CONTROLLED CIRCUIT BREAKER UNIT

Abbott L. Rotch, Milton, Mass., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Aug. 12, 1974, Ser. No. 496,468

Int. Cl.² H01H *61/04*

U.S. Cl. 335—145 **2 Claims**



1. A controlled circuit breaker unit, comprising

a housing having an externally threaded part for threaded coupling in a fuse socket;

a thermal circuit breaker device in the housing in the externally threaded part;

a relay control device in the remainder of the housing in operative contact with the circuit breaker device; and

a common set of movable electrical contacts in the housing utilized by the circuit breaker device and the relay control device, said control device controlling the connection in and disconnection from a power circuit of the circuit breaker device, said electrical contacts being manually resetable to closed position.

3,918,016

ELECTRICALLY CONDUCTIVE PLATES PROVIDING EDDY CURRENT DAMPING FOR AN ELECTRO-MAGNETIC DEVICE

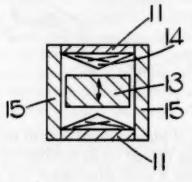
George Frankl, Wembley, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Nov. 25, 1974, Ser. No. 526,688

Claims priority, application United Kingdom, Nov. 28, 1973, 55118/73

Int. Cl.² H01F *7/08*

U.S. Cl. 335—224 **2 Claims**



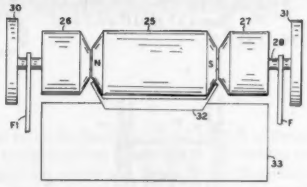
1. An electromagnetic device comprising a frame including a pair of opposed and spaced side members formed from a material having a high magnetic permeability and defining an internal cavity, a permanent magnet pivotally mounted within the cavity and a winding mounted within the cavity whereby when the winding is energised the magnet will tend to turn about its pivot axis so that its magnetic axis will be aligned with that of the winding characterised in that the side members are interconnected at their side edges by a pair of plate

members formed from electrically conductive non-magnetic material, said plate members acting to provide eddy current damping when the magnet is moved relative to the frame.

3,918,017
MAGNETIC ROTARY FILE

Patrick J. McGannon, and Gloria J. McGannon, both of Oceanside, N.Y., assignors to Patrick J. McGannon and Gloria J. McGannon, Oceanside, N.Y.

Filed June 8, 1973, Ser. No. 368,182
Int. Cl.[2] H01F *7/20*
U.S. Cl. 335—285 **6 Claims**

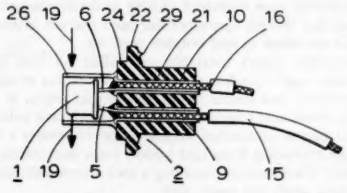


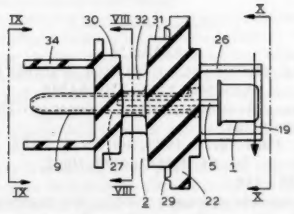
1. Article supporting means comprising,
first and second wheel shaped magnetic members, means to rotatably mount said wheel shaped members,,
said first and second magnetic members defining a wedge shaped gap between them,
and means to provide a magnetic field in said gap, whereby a plurality of wedge shaped magnetic members might be inserted and held in said gap.

3,918,018
LEVEL SENSOR

James H. Tuley, Woodley Lane, and John Capstick, Southampton, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 6, 1974, Ser. No. 467,383
Int. Cl.[2] H01C *7/02, 7/04*
U.S. Cl. 338—28 **18 Claims**



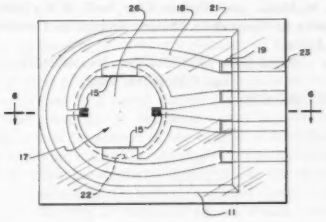


1. A liquid-level sensor for sensing the level of liquid in a container, comprising:
a. a holder adapted for mounting in the wall of the container,
b. a sealed metal can affixed to one side of said holder,
c. a sensing element of semiconductor material mounted within the can on a metal end face of the wall of said can,
d. electrical leads which protrude from the opposite end of said can and extend into said one side of said holder, which leads are electrically connected to said sensing element, and
e. at least one protective lug of said holder which projects at said one side of said holder at least as far as does said can and which only partially surrounds the side of said can to define a free passage for liquid across an outer face of the wall of said can.

3,918,019
MINIATURE ABSOLUTE PRESSURE TRANSDUCER ASSEMBLY AND METHOD

Timothy A. Nunn, Stanford, Calif., assignor to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Mar. 11, 1974, Ser. No. 449,900
Int. Cl.[2] H01C *13/00*
U.S. Cl. 338—42 **5 Claims**



1. An absolute pressure transducer comprising a semiconductor diaphragm, an integral reinforcing area surrounding and defining the boundaries of said diaphragm, means forming a bridge circuit on said diaphragm, said last named means having electrical characteristics related to stress in said diaphragm, conducting pads formed on said reinforcing area in a predetermined pattern, conducting paths connected between said means forming a bridge circuit and said conducting pads, an insulator substrate having a well formed therein with a diametral dimension at least as great as said diaphragm diametral dimension, and conducting leads formed on said insulator substrate spaced thereon to match said predetermined pattern of conducting pads, said substrate and reinforcing area being bonded together with the center of said diaphragm substantially overlying the center of said well for providing a hermetically sealed chamber therebetween, whereby said means forming a bridge circuit is enclosed in said hermetically sealed chamber for protection from ambient environments, said predetermined pattern of conducting pads substantially overlying and electrically conducting portions of said conducting leads, whereby pressure trapped in said sealed chamber provides a reference pressure and stress may be imposed in said diaphragm by ambient pressure.

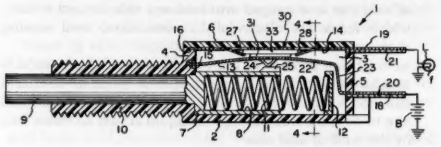
3,918,020
MULTI-STAGE SWITCHING APPARATUS

Gideon A. DuRocher, Mount Clemens, Mich., assignor to Essex International, Inc., Fort Wayne, Ind.

Filed Oct. 24, 1974, Ser. No. 517,490
Int. Cl. H01c *13/00*
U.S. Cl. 338—114 **18 Claims**

1. An electrical switch comprising a pair of spaced apart electrical conductors; switching means; means mounting said switching means in a position to bridge said conductors; oper-

ating means; and means mounting said operating means for movements relatively to said switching means for applying and releasing compressive force to and from said switching means, said switching means comprising a compressible first body



having an electrical resistance which varies inversely in accordance with the compressive force applied thereto by said operating means and a compressible second body having an electrical resistance lower than that of said first body when both of said bodies are compressed by said operating means.

3,918,021

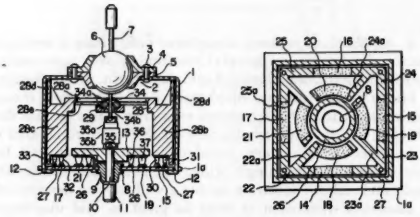
DEVICE FOR SIMULTANEOUSLY CONTROLLING A PLURALITY OF VARIABLE RESISTORS

Matsuo Nishioka, and Shunzo Oka, both of Kadoma, Japan, assignors to Matsushita Electric Industrial Company, Limited, Japan

Filed June 17, 1974, Ser. No. 480,230

Int. Cl.[2] H01C *9/02*

U.S. Cl. 338—128 **9 Claims**



1. In a device for simultaneously controlling a plurality of variable resistors, including a casing having a pair of opposed insulating members, a control shaft pivotally supported by and extending through one of said opposed members, a pair of intersecting slide members each having an elongated guide slot and being slidably movable mutually perpendicularly to each other, one end of said control shaft slidably extending through the guide slots of said intersecting slide members, the improvement in combination therewith which comprises an insulating rotary member rotatably supported on the other member of said casing at a predetermined spacing therefrom, a universal joint coupling the axis of said rotary member with said one end of said control shaft, said variable resistors including a plurality of elongated outer resistive elements in a rectangular frame-like form on the said other member and a plurality of first electrical contact elements equal in number to said outer resistive elements at the opposite ends of each of said intersecting slide members and in slidable electrical contact with the corresponding outer resistive element, and a plurality of inner arcuate shaped resistive elements circularly arranged on the said other member in opposed relation to said rotary member and a plurality of second electrical contact elements equal in number to said inner resistive elements and carried by said rotary member in slidable electrical contact with the corresponding inner arcuate shaped resistive element, said outer resistive elements being electrically interconnected to each other, and each of said outer resistive elements being electrically connected to respective ones of said inner resistive elements.

3,918,022

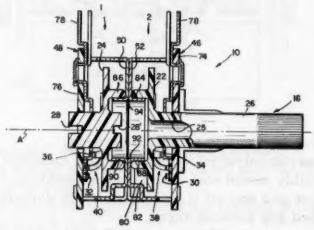
CONTROL DEVICE WITH AXIALLY ALIGNED, INDEPENDENTLY ROTATABLE VARIABLE RESISTORS

George O. Puerner, Frankfort, Ind., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed June 10, 1974, Ser. No. 477,919

Int. Cl.[2] H01C *10/16*

U.S. Cl. 338—134 **3 Claims**



1. A control device comprising

a. a pair of cup shaped members, each having bottom portions and upstanding sides,

b. retaining means holding said cup-shaped members in back-to-back relationship such that said bottom portions abutt one-another,

c. at least two apertures in each of said bottom portions, two of said apertures in one of said bottom portion axially aligned with corresponding apertures in the other of said bottom portions,

d. bearing flanges extending from said apertures into each of said cup shaped members,

e. dielectric base members closing said cup shaped members and having apertures disposed therein in line with said apertures in said bottom portions,

f. dielectric rotors rotatably journalled on said bearing flanges and extending through said apertures in said base members, and means connected to said rotors to manually rotate said rotors, one of said rotors being hollow and said means connected to said rotor comprises a hollow shaft extending from said hollow rotor and means in the other of said rotors receiving a tool inserted through said hollow shaft and rotor, and

g. collector and resistance paths carried by said base members, and electrical contact means carried by said rotors electrically bridging said collector and said resistance paths.

3,918,023

VARIABLE RESISTANCE CONTROL AND METHOD OF ASSEMBLYING THE SAME

John Zdanys, Edwardsburg, Mich., assignor to CTS Corporation, Elkhart, Ind.

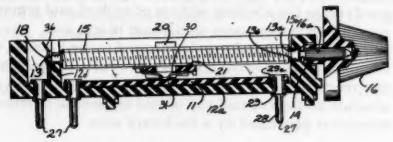
Filed Nov. 5, 1973, Ser. No. 413,162

Int. Cl.[2] H01C *10/40, 10/42*

U.S. Cl. 338—180 **14 Claims**

1. In a variable resistance control, the combination of a housing, a resistance element disposed in the housing, a an electrically conductive lead screw rotatably supported by the housing, an electrically conductive collector element supported in the housing and electrically connected to the lead

screw, a contactor for making wiping contact with the resistance element, a slider for moving the contactor intermediate the ends of the resistance element, an electrically nonconductive motion conversion means connected to the slider and engaging the lead screw for converting the rotational motion



of said lead screw to the translational motion of the slider, said contactor being disposed in relation to the motion conversion means urging the conversion means into engagement with the lead screw and comprising a tab portion in electrical engagement with the lead screw.

3,918,024

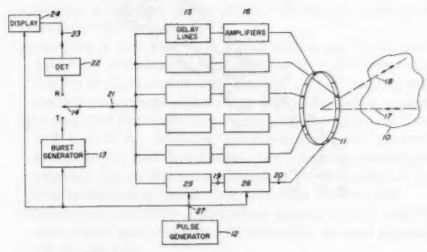
ULTRASONIC ARRAY FOR REFLECTION IMAGING

Albert Macovski, 4100 Mackay Drive, Palo Alto, Calif. 94306

Filed June 24, 1974, Ser. No. 482,262

Int. Cl.² G01S 9/66

U.S. Cl. 340—1 R **15 Claims**



1. Apparatus for obtaining ultrasonic images of reflected waves from an object comprising:

a circular array of transducer elements positioned adjacent to the object forming a transmitter array;

means for driving each of the transmitter transducer elements with a plurality of drive signals whose amplitudes are weighted such that they are at a maximum at the 0° and 180° regions of the circle array whereby a transmitted beam is generated which is well-resolved in the 90°–270° plane;

a receiver transducer array positioned in substantially the same plane as that of the circular array providing a plurality of received signals from the receiver array elements;

means for summing the plurality of received signals from the receiver transducer array to form a processed signal representing a pattern which is well-resolved in the 0°–180° plane; and

means for displaying the processed signal.

3,918,025

ULTRASONIC IMAGING APPARATUS FOR THREE-DIMENSIONAL IMAGE DISPLAY

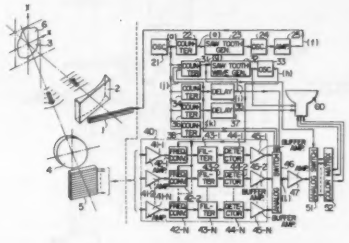
Tsuneji Koshikawa, Sayama; Kageyoshi Katakura, Tokyo; Masaharu Kobayashi, Hachioji, and Yasuaki Tannaka, Tokyo, all of Japan, assignors to Hitachi, Ltd., Japan

Filed July 15, 1974, Ser. No. 488,440

Claims priority, application Japan, July 25, 1973, 48-83126

Int. Cl.² G01S 9/66

U.S. Cl. 340—1 R **8 Claims**



1. An ultrasonic imaging apparatus comprising a first signal source for repeatedly generating a plurality of times a voltage signal whose frequency varies relative to time within a predetermined period of time, a transmitting transducer driven by the output of said first signal source for radiating ultrasonic waves whose direction of radiation varies in one direction depending on the frequency of the output of said first signal source, a receiving transducer divided into a plurality of members in a direction substantially orthogonal to the direction of variation of said ultrasonic waves, a second signal source for generating a plurality of repeated signals which correspond respectively to the individual repeated signals generated by said first signal source and appear at times delayed by different delay times relative to the respective repeated signals generated by said first signal source, a frequency analyzer for carrying out frequency analysis in response to the application of the output of said receiving transducer and the output of said second signal source thereby converting the received acoustic waves into signals representing the relative intensity of the received acoustic waves, a display signal generator for converting the output signals of said frequency analyzer into display signals, and an image display unit for displaying the output signals of said display signal generator.

3,918,026

TRAFFIC SIGNAL CONTROL APPARATUS

Mitsuhisa Hoshika, Takatsuki, and Tsutomu Suzuki, Ootsu, both of Japan, assignors to Omron Tateisi Electronics Co., Japan

Filed May 9, 1973, Ser. No. 358,549

Claims priority, application Japan, May 17, 1972, 47-48835

Int. Cl.² G08G 1/00

U.S. Cl. 340—40 **4 Claims**

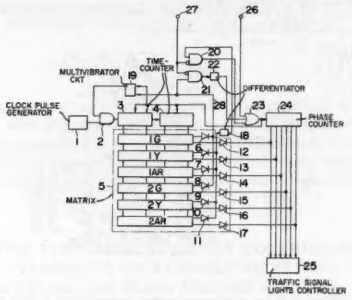
1. A traffic signal control apparatus for advancing the phase of traffic signals at an intersection by counting the time of display periods of the traffic signals by means of local traffic signal equipment at the intersection and a central equipment for controlling a plurality of local traffic signal equipments by generating control signals including control phase advance signals, comprising:

first means, provided in the local traffic signal equipment, for counting the time of display periods of the traffic signals at the associated intersection, said first means generating a signal each time a count value corresponds to a pre-set value in each phase time of display;

second means, provided in the local traffic signal equipment, for advancing the phase of the traffic signals at the associated intersection;

third means for determining coincidence of the phase time of display of the local traffic signals controlled by said second means of the associated local equipment and the control phase time of display controlled by the central equipment, said third means generating a signal upon coincidence;

fourth means responsive to said third means for driving said second means to advance the phase of the traffic signals in accordance with the signal generated by said first



means when said third means does not generate a coincidence signal and for driving said second means to advance the phase of the traffic signals in accordance with control phase advance signals from the central equipment when said third means generates a coincidence signal; and

fifth means for discontinuing counting of said first means in the period between the generation of the signal by said first means and the driving of said second means.

3,918,027

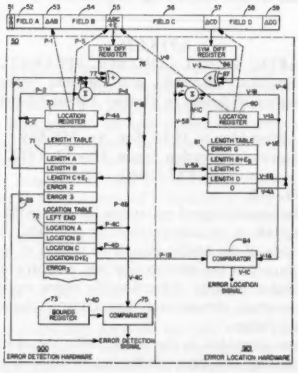
SCANNING AND ERROR CHECKING APPARATUS FOR ADDRESS DEVELOPMENT UTILIZING SYMMETRIC DIFFERENCE ENCODED DATA STRUCTURE

Robert J. Lechner, Needham, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed June 24, 1974, Ser. No. 482,125

Int. Cl.[2] G11B *27/36*; **G06K** *5/00*

U.S. Cl. 340—146.1 F **13 Claims**



13. In combination with a bidirectional scanning apparatus for determining, in a forward or reverse direction, the address of a next sequential field desired in a sequence of field of variable length within a block of information, said fields in said sequence being separated from each other by symmetric difference separators, each symmetric difference separator comprised of the carry-free exclusive-OR addition of the values of the lengths of its adjacent fields on either side of said symmetric difference separator, an apparatus for locating errors in said symmetric difference separators comprising:

a. first means for generating, by a left-to-right (i.e. forward) scan, the absolute address of each of said symmetric difference separators within said block;

b. second means for generating, by a right-to-left (i.e. backward) scan, the absolute address of each of said symmetric difference separators within said block; and

c. third means, coupled to said first and second means, for comparing the absolute address of any of said symmetric difference separators generated by a forward scan to the absolute address of said any of said symmetric difference separators generated by a backward scan.

3,918,028

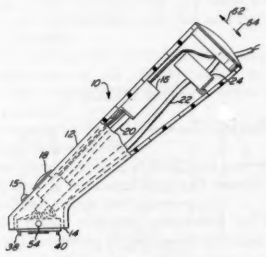
HAND HELD OPTICAL READER

John H. Humphrey, Los Angeles, and Edward Dillingham, Pacific Palisades, both of Calif., assignors to Data Source Corporation, El Segundo, Calif.

Filed Jan. 5, 1973, Ser. No. 321,174

Int. Cl. G06k *9/04*, *7/10*

U.S. Cl. 340—146.3 F **20 Claims**



1. A hand held optical reader for reading human readable characters on a surface, comprising:

a handle;

a light source for providing light to the surface;

a predetermined number of light detectors;

a read head, said read head being connected to said handle, said read head having mounted therein one end of a predetermined number of optical fibers for transmitting light reflected from said surface to said light detectors; said predetermined number of optical fibers being greater than the number of optical fibers required to read a character; and

means for selecting the outputs of said light detectors corresponding to the optical fibers which are used to recognize a character.

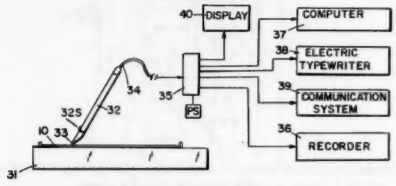
3,918,029
SCANNING SYSTEM AND METHOD

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Continuation-in-part of Ser. No. 160,007, July 8, 1971, Pat. No. 3,735,350, which is a continuation-in-part of Ser. No. 806,398, March 12, 1969, abandoned, which is a continuation-in-part of Ser. Nos. 665,526, Sept. 5, 1967, and Ser. No. 526,546, Feb. 10, 1966, Pat. No. 3,499,650, which is a continuation of Ser. No. 826,370, July 10, 1959, abandoned, which is a continuation-in-part of Ser. No. 450,131, Aug. 16, 1954, abandoned. This application May 22, 1973, Ser. No. 362,676

Int. Cl.² G06K *7/10*

U.S. Cl. 340—146.3 SY **15 Claims**



1. A method of generating data comprising:

recording coded information along a track of a first record member, which recording includes coded information defined by space-separated, separately-scannable digital bit recordings having included therewith primary information recordings and control recordings both disposed aligned with each other along said track, with said control recordings disposed at both ends of said track,

scanning said track of recorded information with a first transducing means,

generating a first electrical signal output on the output of said first transducing means which first electrical signal output is representative of the first of said control information recordings scanned by said transducing means,

applying said first electrical signal output to activate a control means for enabling information signals generated thereafter by said first transducing means in scanning said primary information recordings to be transmitted from said transducing means to a receiving means, and

receiving said primary information signals at said receiving means and applying same to activate a second transducing means and

operating said second transducing means to record primary information transmitted thereto.

3,918,030
GENERAL PURPOSE DIGITAL COMPUTER

Richard L. Walker, P.O. Box 7344, San Diego, Calif. 92107

Filed Aug. 31, 1973, Ser. No. 393,704

Int. Cl.² G06G *9/00*

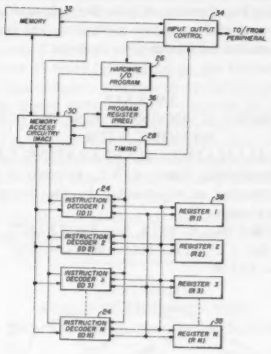
U.S. Cl. 340—172.5 **1 Claim**

1. In general purpose digital computer apparatus of the type having a memory section, input/output section, arithmetic section and a control section, the improvement providing for a variable instruction repertoire in for the control and arithmetic sections comprising:

a. a plurality of instruction decoders being connected in a parallel independent manner with respect to each other,

b. each of said instruction decoders having means connected to said memory section for receiving instructions from and providing instructions to said memory section,

c. each of said instruction decoders having an assigned address whereby the instructions stored in said computer section and received by of said instruction decoders will be executed only by the instruction decoder having an



assigned address which is the same address as that included in said stored instructions.

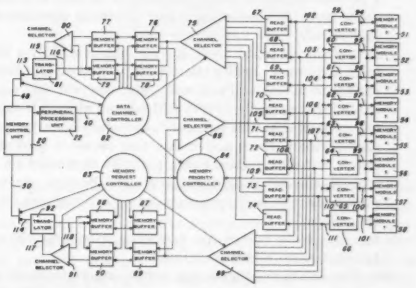
3,918,031
DUAL MODE BULK MEMORY EXTENSION SYSTEM FOR A DATA PROCESSING

William J. Watson, Austin, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 176,383, Oct. 26, 1971, abandoned. This application Oct. 23, 1973, Ser. No. 408,342

Int. Cl.² G06F *15/16*

U.S. Cl. 340—172.5 **3 Claims**



1. A stored program data processing system comprising:

a. a random access central memory having a first predetermined access time for storing data therein;

b. a random memory extension having a second predetermined access time slower than the first predetermined access time for storing data therein;

c. a plurality of data processors;

d. memory control means having data channels connecting said data processors and said central memory to said memory control means said memory control means permitting the accessing of said central memory and said memory extension asynchronously and selectively by each of the plurality of data processors;

e. a first data channel connecting said memory extension to said memory control means;

f. a second data channel connecting said memory extension to said memory control means;

g. a data channel controller for controlling the block transfer of data through said first data channel and said mem-

ory control means between said central memory and said memory extension; and

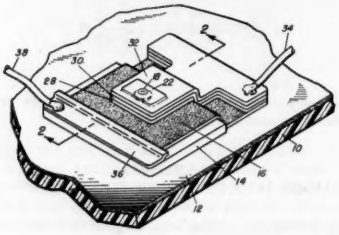
h. a memory request controller, responsive to said plurality of data processors and to said memory extension, for controlling the transfer of data through said second data channel and said memory control means between said processors and said memory extension.

3,918,032

AMORPHOUS SEMICONDUCTOR SWITCH AND MEMORY WITH A CRYSTALLIZATION-ACCELERATING LAYER

Ruth Vogel Nicolaides, Andover, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 5, 1974, Ser. No. 529,877
Int. Cl.² G11C *11/34;* **H01L** *45/00*
U.S. Cl. 340—173 R **6 Claims**



1. A two terminal amorphous switching device with memory which comprises:

a silicon substrate having a first silicon oxide layer thereon;

a bottom electrode means, deposited on said first silicon oxide layer, for providing a first electrical connection to said device;

a second silicon oxide layer, having approximately a **20-50** micron diameter orifice therein, deposited on said bottom electrode means and said substrate, wherein said second oxide layer partially covers said bottom electrode means;

amorphous thin film semiconductor means for providing said device with an active thin film element, said amorphous thin film means being partially deposited on said second silicon oxide layer and said bottom electrode means through said approximately 20–50 micron diameter orifice;

a top electrode means for providing a second electrical connection to said device; and

thin film interlayer means for enhancing crystallization in said device, said interlayer covering said thin film amorphous semiconductor means and being disposed intermediate said amorphous thin film semiconductor means and said top electrode means.

3,918,033

SCR MEMORY CELL

Jerry R. Case, Boulder; Donald L. Millican, Longmont, and David E. Norton, Boulder, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 11, 1974, Ser. No. 522,659
Int. Cl.² G11C *11/40*
U.S. Cl. 340—173 R **18 Claims**

1. A two-state memory circuit, including in combination:

a semiconductive thyratron circuit element having four semiconductive zones of alternating opposite semiconductive conductivity;

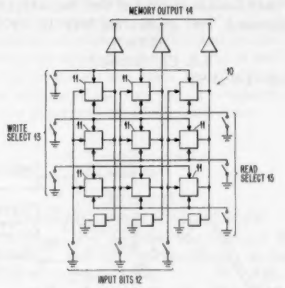
a first one zone being an anode output zone of said semiconductive thyratron circuit element;

two of said zones being control zones, and a fourth one of said zones being a cathode output zone of said semiconductive thyratron circuit element;

power supply terminal means connected to one of said output zones;

an output transistor element having collector, base control, and emitter control portions;

a first one of said control portions being connected to a given one of said output zones;



a resistive circuit element ohmically connecting one of said control zones to said cathode output zone;

read select means electrically connected to a second one of said control portions;

sense output means electrically connected to said collector portion;

write select means electrically connected to said cathode output zone; and

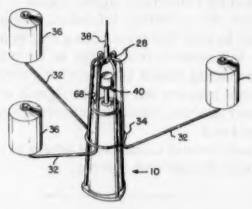
bit input means electrically connected to one of said zones other than said anode output zone.

3,918,034

OIL DETECTION AND SIGNALING SYSTEM

George Otto Orth, Jr., Seattle, Wash., assignor to Petrotek, Inc., Bellevue, Wash.

Filed Feb. 11, 1974, Ser. No. 441,251
Int. Cl.² G08B *21/00, 1/08*
U.S. Cl. 340—236 **12 Claims**



2. An oil-in-water detection unit for detecting and signaling the presence of oil floating on the surface of a body of water, comprising:

a ballasted, water-tight housing having a central bore extending therethrough,

means for maintaining the housing partially afloat in the water with the bore substantially vertical,

an oil sensing assembly including a rod received in the bore of the housing for free vertical movement and a floating oil sensing material secured to one end of the rod having sufficient buoyancy to float the assembly on the water surface, the oil sensing assembly sinking into the water upon detection by the sensing material of oil floating on the surface of the water due to an increase in the specific gravity of the assembly above that of water,

a magnetic reed switch secured adjacent the central bore of the housing and a magnet secured to the end of the rod

extending down into the bore, the magnet closing the reed switch when the oil sensing assembly sinks into the water, and

signal means rendered operative by the reed switch when the oil sensing assembly sinks into the water.

3,918,035
QUANTITY LEVEL GAUGE

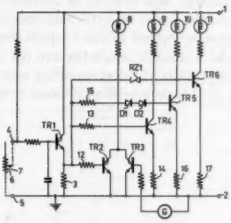
Kamran Eshraghian, Hillcrest, Australia, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 24, 1972, Ser. No. 299,940

Claims priority, application Australia, Oct. 25, 1971, 6765/71; Nov. 12, 1971, 7002/71

Int. Cl.² G08B *21/00*

U.S. Cl. 340—244 R **13 Claims**



1. Apparatus for indicating the value of an unknown quantity comprising, a plurality of light emitting indicator elements, a plurality of voltage comparators each having an output coupled to a respective one of the indicator elements to control the energization thereof, means connecting a first input each of said comparators to a common input terminal supplied with an input voltage related to the unknown quantity, means connecting a second input of each comparator to a predetermined reference voltage that is different for each comparator whereby each comparator supplies an energizing signal to its respective indicator element when the input voltage exceeds its respective reference voltage.

3,918,036
THREAD SUPPLY DEVICE FOR TEXTILE MACHINES

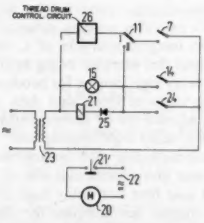
Kurt Arne Gunnar Jacobsson, Ulricehamn, Sweden, assignor to Aktiebolaget IRO, Ulricehamn, Sweden

Filed Mar. 8, 1974, Ser. No. 449,259

Claims priority, application Germany, Mar. 16, 1974, 2313274

Int. Cl.² G08B *21/00;* **D04B** *35/12*

U.S. Cl. 340—259 **10 Claims**



1. In a thread supply device for a textile machine having a drive, the thread supply device including a thread drum to which the thread may be supplied tangentially, a winding drive for loading the thread on the drum, a thread control element which is movable into first and second positions, in which first position the thread is removable axially of the drum at a speed independent of the winding speed so as to permit intermittent thread supply and in which second position the removal speed of the thread from the drum is limited to the winding speed so as to permit positive thread supply, switch means actuable by said thread control element for continuously actuating the winding drive when said control element is in the second position, and sensing means for monitoring the thread supply on the thread drum and for disconnecting the winding drive when the control element is in the first position and a preselected amount of thread is present on the thread drum, comprising the improvement wherein the switch means is an electrical double-throw switch which is disposed in a first switching position during intermittent thread supply and is disposed in a second switching position during positive thread supply, and said sensing means being switched into a circuit by means of the double-throw switch during positive thread supply such that a control circuit causes deenergization of the machine drive when the thread storage on the thread drum differs in one direction from the preselected amount.

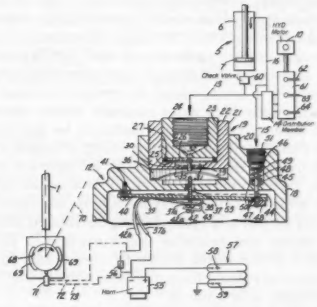
3,918,037
AUDIO LOAD INDICATOR

Thomas R. Hall, 820 Sharon Park Drive, Menlo Park, Calif. 94075

Continuation-in-part of Ser. No. 304,210, Nov. 6, 1972, abandoned. This application May 28, 1974, Ser. No. 474,096

Int. Cl.² G08B *21/00*

U.S. Cl. 340—267 C **3 Claims**



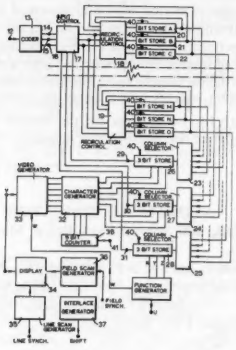
1. In pressure operated mechanism, in combination, a pressure responsive device including a signal member and means in the device connected to and operable by the pressure operated mechanism for actuating movement in response to operating pressure changes therein, the movement aforesaid in turn operating the signal member to provide a warning when a predetermined increase in operating pressure takes place in the mechanism, said device comprising a housing, a load cell comprising a diaphragm to which the operating pressure is directed, the device further comprising a contact unit actuated by the diaphragm, and in alignment therewith for actuation by said diaphragm, a power source and circuitry connecting the contact unit, signal member and power source for operating the signal member for warning as stated, the pressure operated mechanism further comprising hydraulic piston and cylinder instrumentalities connected to lifting means, said instrumentalities including pilot compensating means operable to facilitate return movement of the instrumentalities to initial position, the pressure responsive device including a load cell connected to the piston and cylinder instrumentalities, and a contact unit having means to complete a circuit to produce a signal by the signal member when the predetermined operating pressure is reached, said unit having means to prevent signal operation during the return movement aforesaid.

3,918,038

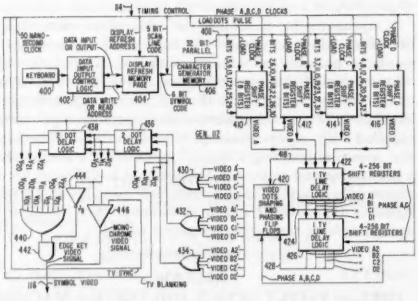
ALPHA NUMERIC RASTER DISPLAY SYSTEM

Dennis A. Stonelake, Burlington, Canada, assignor to Westinghouse Canada Limited, Hamilton, Canada

Continuation of Ser. No. 255,227, May 19, 1972, abandoned.
This application Nov. 9, 1973, Ser. No. 414,295
Claims priority, application Canada, May 26, 1971, 113895
Int. Cl.[2] G06F 3/14
U.S. Cl. 340—324 AD 3 Claims



1. A video display comprising horizontal rows of alphanumeric symbols arranged in vertical columnar arrangement displayed on a cathode ray tube by means of intensity modulation of the beam of said cathode ray tube during selected period while said beam is deflected verticaliy at high speed and horizontally at a lower speed to produce a raster at a frame rate sufficiently high as to minimize flicker when directly viewed, means to receive information to be displayed in row order, a plurality of recirculating stores arranged to receive and recirculate the alpha numeric information in the form of binary code arranged sequentially in accordance with the columnar arrangement of the symbols to be displayed with the binary code for any one symbol being distributed amongst at least two stores and available simultaneously in parallel from the output of said stores, means to convert said parallel code into sequential video information to modulate said beam and thereby display said symbols.



3,918,039

HIGH-RESOLUTION DIGITAL GENERATOR OF GRAPHIC SYMBOLS WITH EDGING

Robert John Clark, Dorion, Canada, assignor to RCA Corporation, New York, N.Y.

Filed Nov. 7, 1974, Ser. No. 521,784
Int. Cl.[2] G06F 3/14
U.S. Cl. 340—324 AD 6 Claims

1. In a digital generator of graphic symbols with edging for display on a display device exhibiting a television raster scan, said generator being of the type which includes a character generator memory responsive to the application thereto of a first multibit symbol code and a second multibit scan line per symbol height code for deriving an m bit parallel dot pattern manifesting a selected scan-line portion of a selected symbol to be displayed; the improvement therein comprising:

a. a set of n shift registers each having k stages, wherein both n and k are plural integers and m is equal to the produce of n times k;

b. means for loading said k stages of each ordinal one of said n shift registers with the i, $n+i$, $2n+i$, . . . $m-n+i$ ordinal ones of said m bits, where i is the ordinal value of that ordinal one of said n shift registers;

c. means for applying as shift pulses to each respective one of said n shift registers a corresponding one of a set of n clocks, each of said n clocks consisting of a series of pulses each having a duration of t which occur at a repetition frequency substantially equal to $1/nt$, and each ordinal one of said set of n clocks being phase delayed by a time interval substantially equal to t with respect to the preceding one of said set of n clocks, to thereby produce a set of respective outputs of said n shift registers each pulse of which has a duration substantially equal to nt,

d. first and second serially connected 1 television scan line delay logic means having the set of respective outputs of said n shift registers applied as respective inputs to said first line delay logic means for producing a first set of corresponding outputs from said first line delay logic means and a second set of corresponding outputs from said second line delay logic means,

e. video dots shaping and phasing flip flops having said set of respective outputs of said n shift registers applied as first inputs thereto, said first set of corresponding outputs applied as second inputs thereto, said second set of corresponding outputs applied as third inputs thereto, and said set of n clocks as fourth inputs thereto for sampling all of each separate group of corresponding ones of said first, second and third inputs with a different respective predetermined one of said set of n clocks, whereby said video dots shaping and phasing flip flops derives first, second and third output dot samples corresponding respectively to said first, second and third inputs thereto, with each dot sample having a duration t;

f. first and second serially connected dot delay logic means, each of which provides a delay substantially equal to a predetermined integral multiple of t, said first, second and third output dot samples being applied as inputs to said first dot delay logic means for producing a first set of corresponding outputs from said first dot delay logic means and a second set of corresponding outputs from said second dot delay logic means, and

g. output means including first means responsive to the presence of that given particular one of said first set of outputs from said first dot delay logic corresponding to said second output dot samples for deriving a monochrome video signal, and second means responsive to the absence of said given particular one of said first set together with the presence of at least another of said first set, any of said first, second and third output dot samples, or any of said second set of corresponding outputs from said second dot delay logic means for deriving an edge key video signal.

3,918,040
CIRCUIT FOR THE RASTER WRITING CONVERSION OF DATA TO BE REPRODUCED ON A VIDEO SCREEN

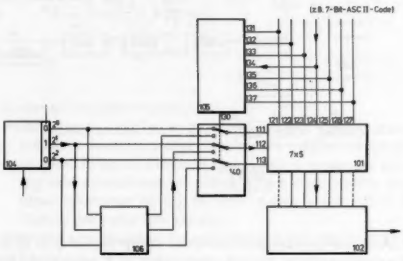
Rudolf Beuter; Walter Reissmann, and Rudolf Cesal, all of Fuerth, Germany, assignors to GRUNDIG E.M.V. Elektro-Mechanische Versuchsanstalt Max Grundig, Fuerth, Germany

Filed Jan. 27, 1975, Ser. No. 544,040

Claims priority, application Germany, Apr. 24, 1974, 2419733

Int. Cl.² G06F *3/14*

U.S. Cl. 340—324 AD **2 Claims**



1. In a circuit for the raster writing conversion of data to be reproduced on a video screen as symbols in a matrix with a gap between symbol lines, said circuit being of the type having a symbol generator, a symbol address storage comprising an input to said symbol generator, said storage transmitting a multidigit binary signal representation of the symbol to be reproduced and a raster line counter comprising another input to said symbol generator, said counter being adapted to shift ahead by one line after each raster line sweep of the video screen, the improvement comprising: a discriminator connected in parallel to said symbol address storage lines, said discriminator including logic means for detecting a multidigit binary signal from said symbol address storage representative of a symbol having a downward appendage, switch means activated by said discriminator to shift from a first position to a second position interposed between said raster counter and said symbol generator, said switch means first position interconnecting the output of said raster counter directly to said symbol generator and said second position interconnecting the output of said raster counter and said symbol generator through a recoding circuit, and a recoding circuit adapted to advance the output of said raster counter.

3,918,041
MULTIPLEX DISPLAY SYSTEM

Roger A. Mao, 5603C S. Doubloon Court, Tempe, Ariz. 85283

Filed Aug. 5, 1974, Ser. No. 495,026

Int. Cl.² G08B *5/36*

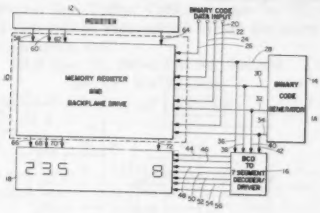
U.S. Cl. 340—336 **20 Claims**

1. A system for displaying numerical or alphanumerical symbols comprising in combination:

means for applying predetermined binary coded signals representing numerical or alphanumerical symbols;

storage means connected to said means for applying predetermined binary coded signals to receive said predetermined binary coded signals for storing each of said numerical or alphanumerical symbols to be displayed;

selection means connected to said storage means for simultaneously selecting for display identical numerical or alphanumerical symbols; and



display means for visually exhibiting identical numerical or alphanumerical symbols stored in said storage means.

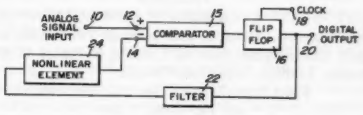
3,918,042
DELTA MODULATOR HAVING INCREASED DYNAMIC RANGE

Richard E. Werner, Hanover Park, Ill., assignor to Motorola, Inc., Chicago, Ill.

Filed Apr. 29, 1974, Ser. No. 464,870

Int. Cl.² H03K *13/06*

U.S. Cl. 340—347 AD **9 Claims**



1. A delta modulator for developing a digital signal in response to a modulating signal, including in combination:

comparator means having input means and an output, said comparator means producing a signal at said output representing the difference between signals applied at said input means,

means applying a modulating signal to said input means of said comparator means,

digital signal generation means coupled to said output of said comparator means and responsive to the signal therefrom for producing a digital signal, and

feedback means coupled between said digital signal generation means and said input means of said comparator means and including filter means and nonlinear translating means, said filter means being connected to the output of said digital signal generation means and producing a signal varying with the average amplitude of said digital signal, said nonlinear translating means being connected to receive the signal from said filter means and producing a modified feedback signal having reduced amplitude in response to a signal from said filter means which is below a predetermined value and said translating means being connected to said input means of said comparator means.

3,918,043
POWER SUPPLY MONITOR

Francis J. Beck, Schurchville, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 18, 1974, Ser. No. 452,790

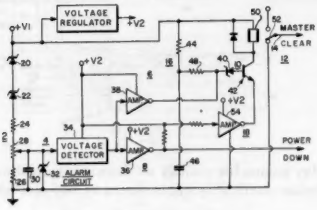
Int. Cl.² G08B *21/00;* **H01H** *47/32*

U.S. Cl. 340—248 B **5 Claims**

1. A power-down monitor circuit comprising:

detection means for monitoring a primary power source output signal and for producing an output signal indicative of an imminent loss of the power source output signal,

alarm means responsive to said output signal from said detection means for producing a control signal representative of an imminent loss of the primary power source output signal and



energizing means for energizing said alarm means with a secondary power source output signal derived from said primary power source output signal and having a signal level below a signal level detected by said detection means to produce said first-mentioned output signal.

3,918,044

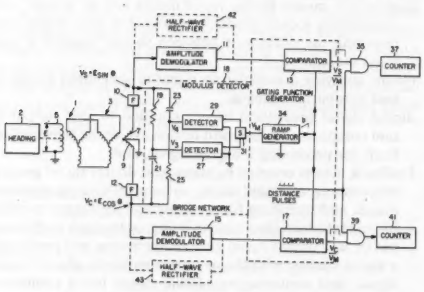
COMPENSATED COORDINATE RESOLUTION CIRCUIT

Dimitri Alpatoff, Victoria, and Jacques Paul-Emile Lamontagne, Chateauguay, both of Canada, assignors to Aviation Electric, Limited, Montreal, Canada

Filed Sept. 7, 1973, Ser. No. 395,109

Int. Cl.[2] G08C *9/04*

U.S. Cl. 340—347 SY **10 Claims**



1. A device for converting angular movement to electrical signals comprising a signal device connected to a source of voltage subject to irregularities and energized thereby and having an angularly displaceable element and providing two signals varying in amplitude as a function of the sine and cosine of the angular displacement, the signals being subject to the irregularities in the energizing source and fluctuating as a result thereof, means for deriving a reference voltage from the two signals including a bridge circuit for shifting the relative phases of the signals equally in opposite directions and for providing a fixed amplitude output except for the source irregularities, and means responsive to the amplitudes of the signals and reference voltage and providing outputs corresponding to the ratios of the signals and the reference voltage in which fluctuations due to irregularities of the energizing voltage are cancelled.

3,918,045

VARIABLE RESOLUTION CONTROL SYSTEM

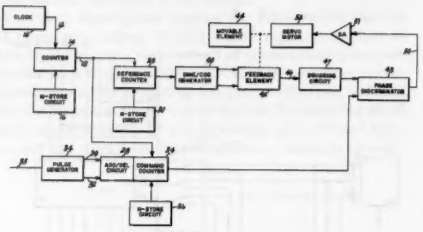
Alfred Harold Morser, Letchworth; Roy Gibson, Biggleswade; Stephen Anthony Scott, Houghton Conquest; Clifford Michael Bailey, Eaton Ford, and Ian Keith Taylor, Biggleswade, all of England, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Nov. 23, 1973, Ser. No. 418,430

Claims priority, application United Kingdom, June 25, 1973, 30094/73

Int. Cl.[2] G05B *1/06, 19/18;* **H03K** *13/02*

U.S. Cl. 340—347 SY **11 Claims**



1. A digital-to-analogue converter comprised in part of first and second counter circuits responsive to a source of clock pulses for producing an analogue reference signal of a constant predetermined frequency and an analogue command signal of the constant predetermined frequency, said second counter circuit including a circuit responsive to a digital input signal for changing the phase relationship of the command signal with respect to the reference signal, said phase relationship representing an analogue output signal, wherein the improvement comprises:

a. means connected between the source of clock pulses and the first counter circuit for scaling the frequency of the clock pulses to produce control pulses;

b. means connected to the first and second counter circuits for loading said first and second counter circuits with a first divisor signal representing a first predetermined number to cause said first and second counter circuits to produce the command and reference signals by dividing the frequency of the control pulses by the first predetermined number, said first predetermined number being chosen as a function of a predetermined resolution of the digital input signal and a predetermined electrical pitch of the analogue output signal; and

c. means connected to the scaling means for loading the scaling means with a second divisor signal representing a second predetermined number to cause the scaling means to divide the frequency of the clock pulses by the second predetermined number, said first and second predetermined numbers being chosen such that the ratio of the frequency of the clock pulses to the product of the first and second predetermined numbers is equal to the constant predetermined frequency.

3,918,046

DIGITAL TO ANALOG CONVERTER

Roy W. Rivers, Conesus, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 227,999, Feb. 22, 1973. This application Jan. 14, 1974, Ser. No. 432,933

Int. Cl.[2] H03K *13/02*

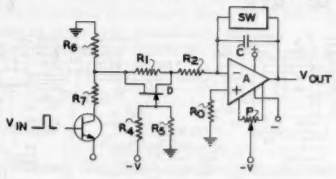
U.S. Cl. 340—347 DA **9 Claims**

4. A digital to analog converter for providing a ramp-like signal in response to a train of input pulses, with each of said pulses having a predetermined ON time and a predetermined OFF time; said converter comprising the combination of

an operational amplifier means having an input terminal and an output terminal,

a first resistive means coupled to apply said pulses to said input terminal,

a capacitive means coupled between said input and output terminals for integrating said pulses,



a second resistive means, and

switch means coupled in parallel with said second resistive means to form a parallel circuit; said parallel circuit being coupled in series with said first resistive means for providing said operational amplifier with a significantly higher input resistance during the OFF times of the pulses than during the pulse ON times,

whereby any tendency for said operational amplifier to drift is reduced.

3,918,047

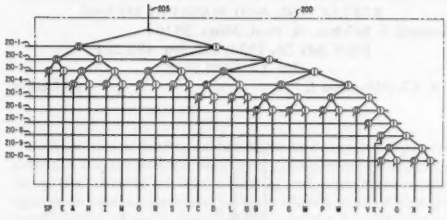
DECODING CIRCUIT FOR VARIABLE LENGTH CODES

Peter Bernard Denes, Gillette, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 28, 1974, Ser. No. 455,785

Int. Cl.² H03K *13/24*

U.S. Cl. 340—347 DD **5 Claims**



1. Apparatus for decoding an input sequence of butted, variable-length prefix code words having a maximum of M digits to derive the corresponding ones of symbols from an output alphabet comprising

A. a tree decoding network in which each tree level corresponds uniquely to one of M digit positions, said tree comprising a terminal node for each symbol in said output alphabet,

B. means for simultaneously applying M digits from said input sequence to said tree network, each digit being applied to a respective row of said tree,

C. first means for detecting which terminal node of said tree has been selected by said M digits,

(D) second means for determining the level of said tree at which said terminal node has been selected by said M digits, and

(E) third means responsive to said second means for determining the beginning point in said input sequence of the code word immediately following the code word beginning with the first of said M digits.

3,918,048

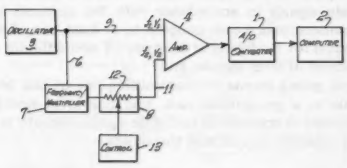
APPARATUS FOR TESTING THE RESOLUTION OF AN ANALOG TO DIGITAL CONVERTER

Glen I. Omura, Sun Valley, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 15, 1974, Ser. No. 460,856

Int. Cl.² H03K *13/00*

U.S. Cl. 340—347 AD **7 Claims**



1. Apparatus for testing the resolution of an analog to digital converter comprising:

a signal source means providing an analog signal having a predetermined frequency and voltage (f_1v_1),

a voltage summing amplifier having first and second inputs, said first input being directly coupled to said signal source means,

electrical circuit means coupling said signal source means to said second amplifier input, said circuit including:

frequency modifying means, and

voltage-modifying means,

whereby a second analog signal (f_2v_2) is summed with said f_1v_1 signal in said summing amplifier, and

an analog to digital converter having an input coupled to said amplifier output for producing in-phase digital samples representative of the f_1v_1 and f_2v_2 analog signals,

whereby resolution at said v_2 voltage can be determined by digitally counting the number of f_2 samples in an f_1 sample and comparing the count with known resolution data.

3,918,049

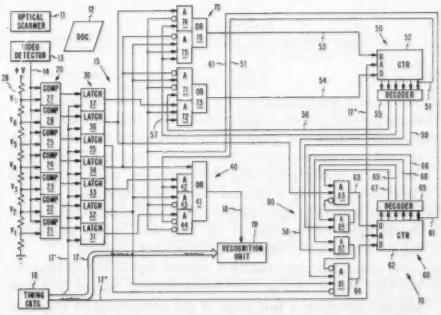
THRESHOLDER FOR ANALOG SIGNALS

Gary Francis Snyder, and David Alan Styczinski, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 317,964, Dec. 26, 1972, abandoned. This application Aug. 5, 1974, Ser. No. 494,941

Int. Cl.² G06K *9/00*

U.S. Cl. 340—146.3 AG **9 Claims**



1. A thresholder for an analog input signal, comprising:

timing means for producing spaced pulses for defining samples of said analog input signal;

converting means for comparing said analog input signal with a plurality of thresholds so as to produce for each of said samples a plurality of binary level signals each indi-

cating whether said input signal exceeds a different one of said thresholds;

control means for combining said binary level signals so as to produce a plurality of direction-control signals indicative of different combinations of said level signals;

counting means for producing state signals indicative of a plurality of said samples, said counting means including a plurality of reversible counters advanceable by said spaced pulses in directions determined by respective ones of said direction-control signals, a plurality of decoders coupled to said reversible counters for producing said state signals in accordance with the contents of said counters, and means coupled to at least one of said decoders for modifying at least one of said different combinations of level signals; and

output gating means for transmitting one of said level signals to a recognition unit, said one level signal being selected in response to said state signals, thereby selecting an optimum one of said thresholds.

3,918,050

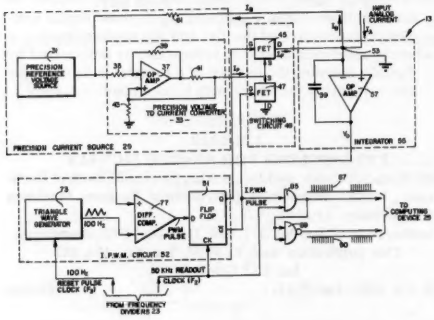
ANALOG-TO-DIGITAL CONVERSION APPARATUS

Adrian K. Dorsman, Bellflower, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

No Drawing. Filed Nov. 18, 1974, Ser. No. 524,841

Int. Cl.[2] H03K *13/20*

U.S. Cl. 340—347 AD **24 Claims**



1. An analog-to-digital conversion system comprising:

first means for generating precision and bias currents;

switching means for passing the precision current as an output precision current during a first mode of operation and for directly returning the precision current to said first means during a second mode of operation;

integrator means for generating a first signal proportional to the integral of the sum of the bias and output precision currents and an unknown input analog current;

second means for generating a second signal in response to the first signal, the second signal having one of first and second states as a function of the amplitude of the first signal;

third means responsive to the second signal and to clock pulses for controlling the first and second modes of operation of said switching means and for generating an output pulse rate of clock pulses proportional to the unknown input analog current.

3,918,051

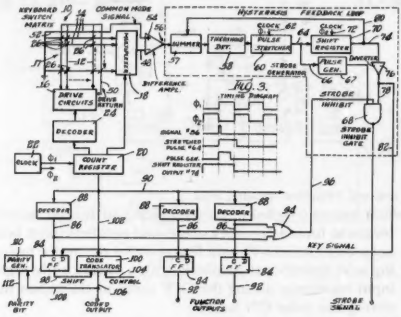
N-KEY ROLLOVER KEYBOARD

Victor M. Bernin, Mount Prospect, and Keith A. Engstrom, Chicago, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Continuation of Ser. No. 339,476, May 19, 1971, abandoned, which is a continuation of Ser. No. 144,902, March 8, 1973, abandoned. This application June 10, 1974, Ser. No. 478,361

Int. Cl.[2] G08C *25/00*

U.S. Cl. 340—365 E **6 Claims**



1. A keyboard comprising a switching matrix having a plurality of drive wires and a plurality of sense wires arranged to form a plurality of junctures where signal coupling between said drive wires and said sense wires can occur, a common drive wire return wire located in close proximity to and in magnetic field opposition to the drive wires for magnetic field cancellation to reduce cross talk between the drive wires and sense wires, and a plurality of switches located at said junctures for selectively coupling said drive wires and said sense wires.

3,918,052

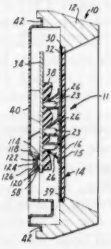
SHALLOW DISPLAY AND DIGITAL CLOCK INCLUDING REFLECTING AND MASKING MEANS

Kenneth J. Bricher, St. Paul, Minn. 55104

Filed July 26, 1974, Ser. No. 492,201

Int. Cl. G09f *9/32*

U.S. Cl. 340—366 E **10 Claims**



1. A display comprising:

a face portion having a viewed surface, a back surface opposite said viewed surface, means for providing a barrier to the transmission of light between said surfaces having at least one opening defining elongate generally rectangular light transmissive area through said face portion, and a surface formed as a flys-eye lens over said light transmissive area; walls having generally specularly reflective surfaces defining, with said back surface, a light transmissive cavity communicating with said light transmissive area, said reflective surfaces including an end surface which is approximately parabolic about an axis at

a right angle to said surfaces and which axis is centered along and spaced from one side of said elongate light transmissive area with said end surface extending to the ends of said elongate area, and a generally planar rear surface extending from the side of said elongate light transmissive area opposite said axis to an intersection with said end surface and diverging with respect to said back surface from said side of the elongate light transmissive area opposite said axis at an included angle with said viewed surface of between about 30 to 60 degrees;

a lamp in said cavity at said axis; and

electronic means for selectively activating said lamp.

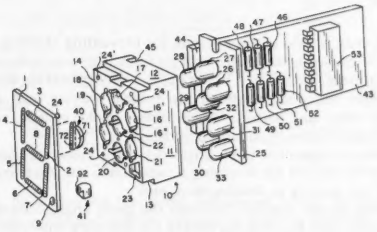
3,918,053
DIGITAL DISPLAY

Herbert Towne, Glen Head, and Harold Rapp, Flushing, both of N.Y., assignors to Dialight Corporation, Brooklyn, N.Y.

Continuation-in-part of Ser. No. 268,717, July 3, 1972, abandoned. This application Aug. 6, 1973, Ser. No. 385,649

Int. Cl. G09f *9/32*

U.S. Cl. 340—380 **7 Claims**



1. A character display device of the line segment type comprising a display surface having an arrangement of open segments for display of any numeric and alphabetic symbol against an opaque background upon illumination of a proper combination of segments thus forming the desired numeric symbol, a plurality of sockets arranged behind said display surface, one of said sockets being arranged substantially behind each of said open segments, a light emitting diode of the p-n junction type for producing visible light upon electrical energization thereof carried within each of said sockets for illumination of its respective open segment when said diode is caused to produce visible light, a lens element for even and uniform distribution of the visible light produced by the light emitting diodes, said lens element comprising a base section and a raised section, the base section having a rear surface and the raised section having a front surface, said base section being adapted to fit within said socket and said raised section being adapted to fit within the respective open segment, the rear surface of the base section and the front surface of the raised section of said lens being ridged, said front ridged surface of said lens element being substantially flush with the surface of said display surface when said raised section is fitted with the open segment so that upon energization of a light emitting diode its respective open segment will be illuminated by light passing through the lens element having its raised section fitted within the segment.

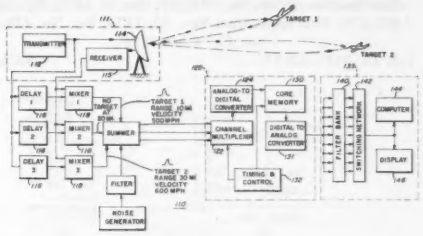
3,918,054
TIME COMPRESSION SYSTEM ADDING NOISE TO ALLOW ONE BIT QUANTIZATION

John D. Collins, Burlington, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 174,221, Aug. 23, 1971, abandoned, which is a continuation of Ser. No. 787,504, Dec. 27, 1968, abandoned. This application Sept. 5, 1973, Ser. No. 394,592

Int. Cl. G01s *9/02, 9/06*

U.S. Cl. 343—5 DP **15 Claims**



7. In combination:

a plurality of information signal channels;

a source of noise signals which is substantially random with respect to said information signals in said channels;

means for combining noise derived from said source of noise signals with the information signals in each of said channels;

means for sequentially sampling each of said channels at a rate substantially above the frequency spectrum of said information signals and for storing a component of said signals in said sampling sequence; and

means for deriving said information from said combined signals comprising means for reading said stored components of said signals in a different sequence from said storing sequence.

3,918,055
CLUTTER SIGNAL SUPPRESSION RADAR

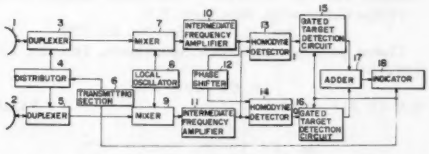
Hirotoshi Shimizu, Kobe, and Toshiaki Uozumi, Kakogawa, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed July 13, 1973, Ser. No. 378,817

Claims priority, application Japan, July 14, 1972, 47-70494

Int. Cl.[2] G01S *9/02, 9/37*

U.S. Cl. 343—5 R **5 Claims**



1. A clutter signal suppression radar system comprising:

antenna means for emitting at least first and second waves of different polarizations and for receiving corresponding first and second reflected waves and producing in response thereto corresponding first and second reflected wave signals;

first and second amplifier means, each having a linear logarithmic input-output characteristic, for amplifying said first and second reflected wave signals, respectively in amplitude while retaining the phases of the respective wave signals and producing corresponding first and second amplified output signals;

phase detector means for receiving said first and second amplified output signals of said first and second amplifier means and producing an output signal in response to the

phase difference between said first and second output signals; and

means for extracting frequency spectrums of target signals contained in the phase difference output signals of said phase detector means.

3,918,056

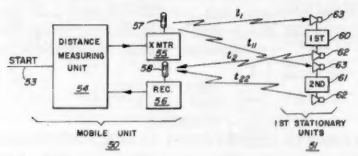
RADAR TRILATERALIZATION POSITION LOCATORS

James W. Merrick, El Paso, Tex., assignor to Del Norte Technology, Inc., Euless, Tex.

Continuation of Ser. No. 195,687, Nov. 4, 1971, Pat. No. 3,810,179. This application Nov. 30, 1973, Ser. No. 420,448

Int. Cl.[2] G01S 9/56

U.S. Cl. 343—6.5 LC **5 Claims**



1. A radar trilateralization position locator system including a first unit and at least two other monitoring units, each of said monitoring units being uniquely identified by its own pulse repetition rate, said first unit comprising digital gate means for generating and transmitting cyclically recurring digitally repetitive interrogation radar signals to said other monitoring units at a fixed monitoring unit identifying pulse repetition rate, digital gate means in each of said other units for monitoring said interrogation radar signals to digitally detect the particular and unique cyclic digital signals having the pulse repetition rate identifying the monitoring unit, digital means in the particular one of the other monitoring units which is identified by a detected pulse repetition rate for digitally retransmitting a radar signal at said cyclically recurring repetition rate as a reply signal to said first unit, and means in said first unit operated responsive to the receipt of said reply signal for indicating the time required for said signal to make a round trip from said first unit to the other monitoring unit identified by said detected cyclically recurring pulse repetition rate and return to said first unit.

3,918,057

CIRCUIT ARRANGEMENT FOR THE IDENTIFICATION OF VEHICLES

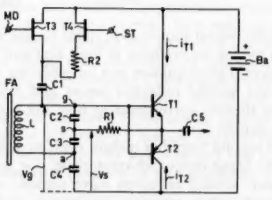
Nicolaas Van Tol, Hilversum, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 16, 1974, Ser. No. 433,770

Claims priority, application Netherlands, Feb. 28, 1973, 7302764

Int. Cl.[2] G01S 9/56

U.S. Cl. 343—6.8 R **3 Claims**



1. A circuit arrangement for vehicle identification, particularly a transponder for transmitting an encoded signal in response to an interrogation signal, comprising:

a tuning circuit for controlling said transponder having first, second, and third tapping points; and

gating means for activating said transponder upon reception of said interrogation signal, comprising

terminals for connection of a battery, and

two transistors of opposite type connected in series between said terminals, said transistors having emitter electrodes connected to said first point of said tuning circuit, base electrodes connected to each other and to said second point of said tuning circuit, said third point being connected to one of said terminals.

3,918,058

VEHICLE SKID CONTROL SYSTEM

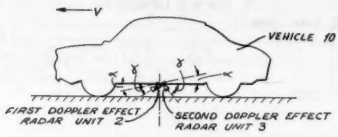
Yasumasa Noyori, and Mitsuyoshi Horiba, both of Kobe, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 29, 1973, Ser. No. 364,557

Claims priority, application Japan, May 30, 1972, 47-54100

Int. Cl. G01s 9/02

U.S. Cl. 343—7 ED **7 Claims**



1. A vehicle skid control system for preventing skidding of a vehicle caused by excessive braking force, the vehicle having braking means including a brake pedal whereby braking force is applied, the pitch angle of the vehicle varying with the braking force and with the deceleration of the vehicle, said vehicle skid control system, comprising.

gravity independent pitch angle detecting means mounted on the vehicle for detecting a variation in the pitch angle of the vehicle in deceleration; and

control means coupled between the pitch angle detecting means and the braking means for reducing the braking force when the pitch angle exceeds a predetermined level.

3,918,059

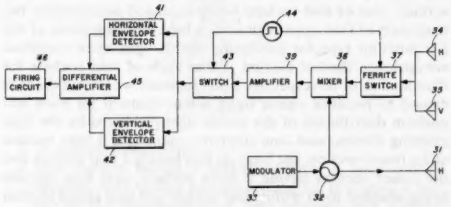
CHAFF DISCRIMINATION SYSTEM

Donald J. Adrian, Arlington, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 6, 1959, Ser. No. 797,816

Int. Cl.[2] G01S 9/02; H04K 3/00

U.S. Cl. 343—7 PF **1 Claim**



1. A microwave fuze system for a missile including a firing circuit having means for discriminating between a target and a countermeasure reflector, comprising in combination, a frequency modulated transmitter, an antenna coupled to said transmitter and radiating a signal polarized in a predetermined direction, a pair of receiving antennas including one antenna polarized in the same direction as said transmitting antenna and one antenna polarized in a direction normal to said trans-

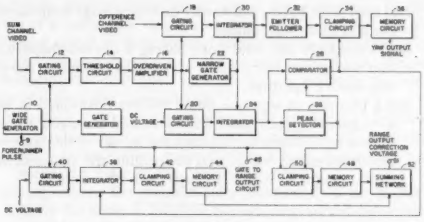
mitting antenna, a first switch means coupled to said receiving antennas and adapted to alternately connected said receiving antennas to a mixing means whereby the received signals are mixed with a portion of the transmitted signal, means for amplifying a band of said mixed transmitted and received signals, a pair of envelope detector means connected to said amplifying means by a second switch means, a difference amplifier adapted to receive the output from said pair of envelope detector for coupling a firing signal to said firing circuit when the energy level of the output of a certain one of said detectors exceeds the energy level of the other detector output, and a periodic wave control means actuating said first and second switch means whereby saidpair of receiving antennas and said pair of envelope detectors are synchronously connected to said mixing means and said amplifying means respectively.

3,918,060

TERMINAL AIM POINT REFINEMENT CIRCUIT

Frederick C. Alpers, Riverside, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 24, 1972, Ser. No. 274,550
Int. Cl.² G01S 9/14, 9/22
U.S. Cl. 343—7.3 **8 Claims**



4. In a terminal aim point refinement circuit for use in a missile guidance system wherein a single composite video signal from the seeker contains the monopulse sum signal and a yaw signal for each range element separated in time by a predetermined amount, the combination comprising;

a. gate circuit means adapted to receive the composite signal from the seeker and gating said composite signal with precisely spaced gates periodically,

b. pulse stretching circuit means coupled to said gate circuit means for stretching each of the gated elements,

c. signal processing circuit means coupled to said pulse stretching circuit means for providing an output signal which is a ratio of the yaw signal amplitude to the corresponding sum signal amplitude representing the angular position of the source of that particular gated signal segment with respect to the seeker antenna axis,

d. and frequency sweep generator means coupled to said signal processing circuit means for sweeping the yaw and sum signals jointly in range thereby allowing this sequence to be repeated for consecutive signal elements with successive periodic gating.

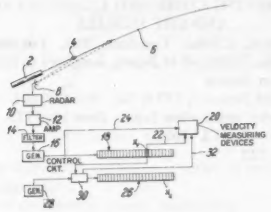
3,918,061

VELOCITY MEASURING DOPPLER RADAR

Christen Hagbard Elgaard, Risskov, Denmark, assignor to Terma Elektronisk Industri A/S, Denmark

Filed Sept. 25, 1973, Ser. No. 400,651
Int. Cl.² G01S 9/44
U.S. Cl. 343—8 **11 Claims**

1. A Doppler Radar device for measuring the velocity of an object moving in a trajectory in at least two different measuring points or portions of the trajectory, said device comprising transmit-receive unit means for producing a series of Doppler oscillations the momentary frequency of which is a function of the velocity of the object, counter means for counting a predetermined number of Doppler oscillations ocurring during the movement of the object along a first part of its trajectory until it reaches the first measuring portion thereof and for producing a first control signal in response to the predetermined count in said counter means being attained, means for measuring the velocity of the object including frequency registering means responsive to the first control signal for registering the frequency of the Doppler oscillation at least during the movement of the object along the first measuring portion of the trajectory, and control means for controlling said velocity measuring means at least when the object has moved to the



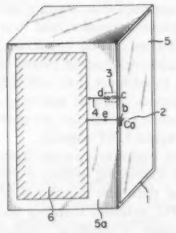
next measuring point or portion of the trajectory, said control means including time measuring means for registering the length of a first time interval during which the object moves along the first portion of its trajectory until the predetermined count of said counter means is attained and for providing a second time interval proportional to the first time interval, said time measuring means being responsive to said counter means attaining the predetermined count for initiating timing of the second time interval and providing a second control signal to said velocity measuring means upon completion of the second time interval so as to permit determination of the velocity of the object.

3,918,062

RECEIVING LOOP ANTENNA SYSTEM

Hiroshi Haruki; Yoshiyasu Hiroi, both of Yokohama, and Kyohei Fujimoto, Fujisawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed July 24, 1974, Ser. No. 491,269
Claims priority, application Japan, Aug. 1, 1973, 48-87145
Int. Cl.² H01Q 1/24, 7/00
U.S. Cl. 343—702 **5 Claims**



1. In a receiving loop antenna system especially adapted for use as a built-in antenna which consists of a loop antenna and a grounding plate perpendicular to the loop antenna for a portable wireless set, the antenna output terminals being tapped at such points that said antenna may be matched with the input impedance of said wireless set, the improvement comprising

a series-connected circuit comprising

a. a circuit having series resonant circuit characteristics and tuned to the center frequency of the operating frequency range of said wireless set, and

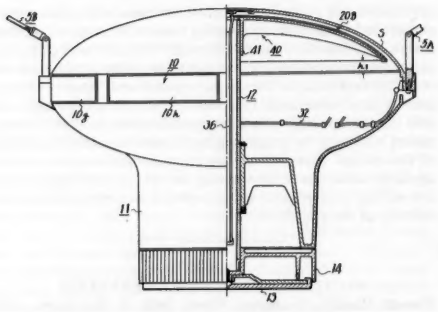
b. a transmission line having such a length as to attain the impedance matching which minimizes the noise in the proximity of said center frequency,

said series-connected circuit being inserted between the output terminals of said antenna and the input terminals of said wireless set.

3,918,063
ANTENNA HAVING COMBINED ELEMENTS FOR VHF AND UHF SIGNALS

Koya Nakamichi, Chofu; Toshitada Doi, Yokohama, and Kosuke Akiba, Tama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed June 13, 1974, Ser. No. 479,101
Claims priority, application Japan, June 15, 1973, 48-67443
Int. Cl.² H01Q *3/02, 21/30*
U.S. Cl. 343—722 **6 Claims**



1. Antenna apparatus having combined elements for receiving VHF and UHF signals, comprising:

a VHF antenna member disposed in a loop formed of plural, spaced apart conductive plates, a first pair of adjacent plates being connected to feeding terminals, a second pair of adjacent plates opposite said first pair of plates being interconnected by a load impedance, and at least third and fourth pairs of adjacent plates being interconnected, respectively, by at least first and second respective UHF signal trap means, each of said trap means comprising a parallel resonant circuit for presenting maximum impedance to received UHF signals;

a UHF antenna member spaced from said VHF antenna member and extending within a circular area having a diameter less than the diameter of said VHF antenna loop, said UHF antenna member including a wave-guide conducting plate, a radiator conducting plate and a reflector conducting plate, and having optimum directivity in a direction substantially normal to the plane of said VHF antenna loop;

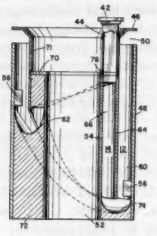
first rotatable support means mechanically coupled to said VHF antenna member for rotating same in the plane of said loop; and

second rotatable support means coaxial with said first rotatable support means and mechanically coupled to said UHF antenna member for rotating same in a plane parallel to said loop.

3,918,964
WIDE ANGLE ANTENNA SYSTEM

Jacob Joseph Gustincic, Los Angeles, Calif., assignor to Cubic Corporation, San Diego, Calif.

Filed Dec. 26, 1973, Ser. No. 427,797
Int. Cl.² H01Q *3/26*
U.S. Cl. 343—783 **17 Claims**



1. A microwave antenna comprising,

a parallel plate waveguide with a parallel plate flared feed horn,

said feed horn having outwardly diverging edge walls to said parallel plate waveguide,

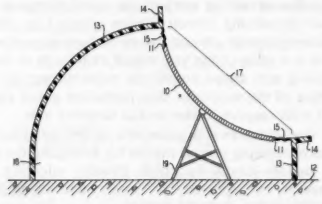
said waveguide and feed horn having a curved shape with said waveguide being open at one end forming a curved ring source aperture,

and a plurality of separate phase shifters positioned in said waveguide adjacent said feed horn and arranged around the curved volume for dividing the power of the received electromagnetic waves and controlling the phase of the electromagnetic waves through each phase shifter.

3,918,065
WINDSHIELDING STRUCTURE FOR AN ANTENNA

Paul Trice Hutchison, Rumson, and John William McCulloch, Freehold, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 19, 1974, Ser. No. 462,351
Int. Cl.² H01b *1/42*
U.S. Cl. 343—872 **9 Claims**

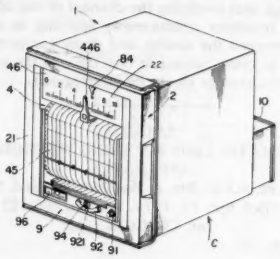


1. A windshielding antenna structure comprising a parabolic section dish antenna mounted on a base plane, a structure surrounding the antenna dish but having an opening corresponding to and slightly larger than the antenna dish, said structure being positioned so that electric waves reflected from the dish pass through the opening of said structure, a flexible membrane extending from the entire edge of said antenna dish to the opening of said structure whereby head-on wind is diverted from the edge of said antenna dish to said structure thereby preventing mechanical oscillations of said antenna dish due to wind, said dish being capable of controlled movement relative to said structure surrounding said antenna dish.

3,918,066
RECORDING CONTROLLER

Hisaya Fujita; Kinji Harada, and Toru Tanazawa, all of Musashino, Japan, assignors to Yokogawa Electric Works, Ltd., Tokyo, Japan

Filed Dec. 12, 1974, Ser. No. 531,981
Claims priority, application Japan, Dec. 17, 1973, 48-141721
Int. Cl.² G01D *15/16*
U.S. Cl. 346—17 **6 Claims**



1. A recording controller of the type arranged to receive an electrical measurement input signal corresponding to the value of a controlled variable, and, in response to the electrical input signal, to indicate and record the measured value of the variable and to govern a pneumatically controlled element influencing the controlled variable so as to maintain the variable at a set value, comprising:

indicating and recording means for receiving the electrical measurement input signal and for mechanically positioning a measurement pointer along a scale to indicate the measured value of the controlled variable;

setting means for mechanically positioning a set pointer along the scale to indicate the set value of the controlled variable;

differential linkage means, mechanically coupled to the means for positioning the measurement and set pointers, for mechanically detecting a deviation between the measured and set values of the controlled variable and for displacing the position of a mechanical element in correspondence with the detected deviation; and

pneumatic controller means responsive to displcacement of the mechanical element to generate a prescribed pneumatic control signal for application to the pneumatically controlled element to correct the detected deviation,

whereby the recording controller provides a pneumatic control signal directly from the indicating and setting means, without a separate electrical-to-pneumatic transducer.

3,918,067
BIFURCATED PHOTOTYPESETTER AND HEADLINE MACHINE

Thomas Allan Booth, Flanders, N.J., assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio

Filed June 17, 1974, Ser. No. 479,615
Int. Cl.² B41B *13/00*
U.S. Cl. 354—5 **4 Claims**

1. A convertible phototypesetter and display size type printing machine, comprising:

an original object holder and means to illuminate an object positioned on said holder;

a primary lens positioned to gather light rays from said illuminated object and form an aerial image of the object:

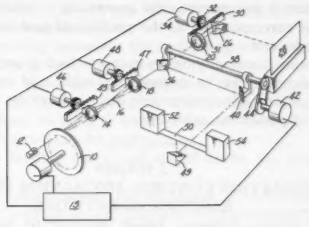
a first composing system, comprising:

1. a collimating and de-collimating lens optically coupled;

2. means to alter the magnification of the aerial image of said object for producing variable size aerial images, and means to maintain said collimating lens its own focal length from the aerial image produced by said primary lens;

3. a mirror in the optical path of said decollimating lens for bringing the image produced by said primary lens, collimating and de-collimating lenses, to focus on an image plane;

4. a drive system for stepping said image diverter means through a limited distance in said optical path for spacing successive images in a series to produce a line of composition;



a second composing system, comprising:

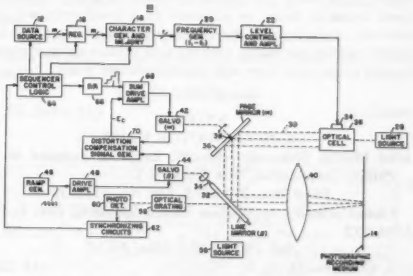
a mirror and means to selectively interpose said mirror between said collimating lens and de-collimating lens; and

a secondary mirror system to project said image into an image plane separate from said first composing system.

3,918,068
DISTORTION CORRECTION APPARATUS FOR ELECTRO-OPTICAL REFLECTORS WHICH SCAN BEAMS TO PRODUCE IMAGES

Robert V. Reinke, Penfield; John E. Newton, Rochester, and Robert L. Reifsteck, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed June 14, 1974, Ser. No. 479,382
Int. Cl.² G03B *17/08*
U.S. Cl. 354—17 **6 Claims**



1. For use in computer output microfilmer apparatus or the like for recording characters derived from a data source on a light sensitive medium, said apparatus comprising frequency generator means for producing a complex signal having a plurality of different frequencies, character generator means for operating said generator means to produce any of said different frequencies, a simultaneous multi-beam acousto-optic cell adapted to receive a beam of light and responsive to said complex signal for simultaneously forming a number of light beams each corresponding to a different frequency thereof, a first mirror and a second mirror for scanning said beams in a first direction and in a second direction perpendicular to said first direction to form a pattern of successive lines on said medium on which said characters are recorded, said

first direction being along said lines and second directions being between the topmost and bottom-most of said lines so that a page of said lines can be recorded, a lens for focusing said beams to obtain the size of said page to predetermined size, and first and second current driven galvanometers for rotating said first and second mirrors, the improvement comprising:

a. a signal generator responsive to the current which drives said first galvanometer and the current which drives said second galvanometer for generating a compensating signal corresponding to the position of said beams on said page; and

b. means for modifying the current which drives said second galvanometer in accordance with said compensating signal to effect correction for pin cushion distortion in said pattern on said page.

3,918,069

ENERGIZATION CONTROL MECHANISM IN CAMERA ELECTRICAL NETWORK

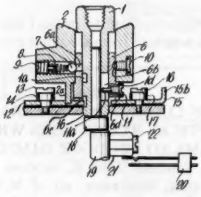
Fumio Urano, Saitama, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 6, 1974, Ser. No. 467,345

Claims priority, application Japan, May 11, 1973, 48-1723

Int. Cl.² G03B 17/00

U.S. Cl. 354—23 R **10 Claims**



1. In a camera including a light determining network, means including a switch connecting said network to a source of current, a shutter release member movable between a retracted position and an advance shutter release position, means for closing said switch in response to said shutter release member being in advance of a predetermined point between said advanced and retracted positions; and first locking means for releasably locking said shutter release member against retraction from said predetermined point.

3,918,070

SEMICONDUCTOR DEVICES

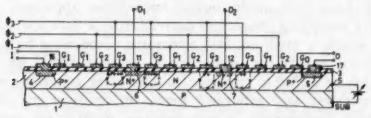
John Martin Shannon, Salfords, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 27, 1973, Ser. No. 419,435

Claims priority, application United Kingdom, Dec. 1, 1972, 55563/72

Int. Cl.² H01L 27/04, 29/78

U.S. Cl. 357—24 **16 Claims**



1. A semiconductor device comprising a semiconductor body, a plurality of spaced conductive layers extending over and insulated from a surface layer of the semiconductor body, said conductive layers forming with underlying regions of the surface layer and the intervening insulating material a plurality of succeeding capacitance charge storage means whereby charge can be stored in said body at a plurality of sites and on application of appropriate potentials to the conductive layers charge can be transferred sequentially in a preferred direction via said storage means, a plurality of field effect transistor structures each having a channel region constituted by a region of the semiconductor body underlying a different charge storage site of the charge storage means, the size of each channel being affected by the amount of charge stored in the overlying site, and means including source and drain connections to the semiconductor body for obtaining an instantaneous output indicative of the individual charge stored in each of the storage sites overlying the channel of one of said plural field effect transistor structures by applying an appropriate potential between the source and drain connections which would tend to cause current to flow through the said channel underlying the storage site to be interrogated.

3,918,071

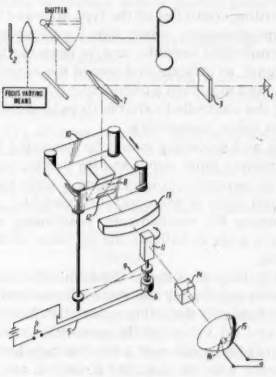
AUTOMATIC LENS FOCUSING METHOD AND APPARATUS

Fritz Albrecht, R.F.D. Rte. 4, Box 240, Brevard, N.C. 28712

Filed Apr. 11, 1974, Ser. No. 460,122

Int. Cl.² G03B 3/10

U.S. Cl. 354—25 **2 Claims**



1. In an automatic focusing camera of the type comprised of a camera lens; means for focusing the image to be photographed; a screen upon which the image is focused, and a shutter, where the improvement comprises:

means to vary the focus of said camera lens between two positions;

photoelectric scanning means to optically scan the image focused upon said screen to derive a corresponding electrical output signal comprising

a closed-loop slotted belt surrounding said screen, means to rotate the belt around the screen, the slots being so arranged that as the slotted belt rotates successive slots expose successively different horizontal segments of the screen at a given time;

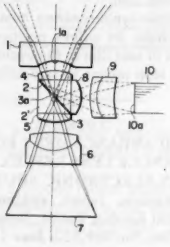
a rotating prism which scans the screen through the slots; lens means to focus the successive horizontal segments of the image on the screen defined by the slots and transmitted through the slots and prism, a photoelectric device for sensing the light passing through said lens means; the entire image on the screen thereby being scanned during each cycle of rotation of the belt;

said means to rotate the slotted belt also synchronously rotating the prism, and discrimination means to determine when the electrical output of said photoelectric device contains a maximum of high frequency components indicative of sharp focusing of the image and to control said means to vary the focus accordingly.

3,918,072
SINGLE-LENS REFLEX OPTICAL SYSTEM FOR AN ENDOSCOPE

Toshihiro Imai, Fuchu; Takeshi Okada, Hachiouji, and Nobuo Yamasita, Iama, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 11, 1973, Ser. No. 423,792
Claims priority, application Japan, Dec. 13, 1972, 47-124979
Int. Cl.² G03B *29/00*
U.S. Cl. 354—62 **4 Claims**

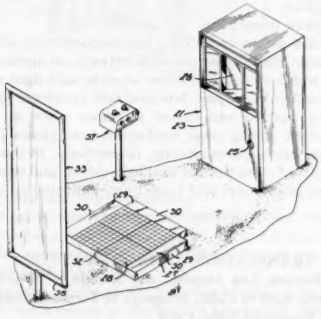


1. A single-lens reflex optical system for an endoscope of the type which is inserted into body cavities, said optical system arranged at the distal end of the endoscope and comprising a photographing optical system, a reflecting mirror arranged in inclined position with respect to the optical axis of said photographing optical system and having means defining a small hole arranged substantially at the stop of said photographing optical sytem and functioning as an aperture stop therefor, a film, said photographing optical system focusing photographing light penetrating the hole on the film, said reflecting mirror functioning to reflect observing light, an observing optical system and an image guide arranged along the optical axis of the observing light, wherein the observing light is focused on an end surface of said image guide.

3,918,073
GOLF TEACHING AID APPARATUS

James F. Henderson, 1013 E. 14, and Stephen D. Gaffaney, 1817 N. Cook, both of Spokane, Wash. 99207

Filed Mar. 18, 1974, Ser. No. 452,437
Int. Cl.² G03B *1/00*
U.S. Cl. 354—120 **17 Claims**

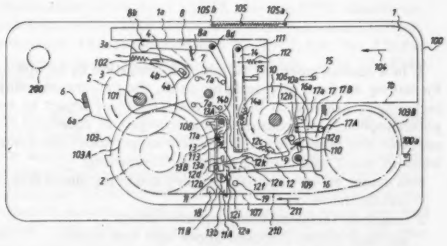


1. A golf teaching aid apparatus for assisting a golfer in analyzing and improving his golf swing, comprising:
a platform for supporting a golfer;
a hitting surface on said platform simulating the location of a golf gall and the intended direction of flight of the golf ball, to orient the golfer in prescribed hitting condition as he swings a golf club from a backswing movement, rearward and upward from the hitting surface, a down swing movement forward and downward toward the hitting surface, and a follow-through movement forward and upward from the hitting surface;
an enclosure facing the platform;
a plurality of cameras having lenses and shutter assemblies arranged in a rectangular array within the enclosure wherein each assembly has a separately operable shutter; said plurality of cameras having a common exposure chamber spaced from the lenses defining a focal plane common to the lenses where separate images are focused by the lenses, said images being separated over a prescribed rectangular area;
shutter operating means for sequentially operating the shutters over a desired time interval;
a visual aid blank having dimensions complementary to those of the exposure chamber and having a photo-sensitive surface thereon of areal dimension exceeding said prescribed rectangular area;
means for feeding the visual aid blank to the exposure chamber;
a mirror situated within the enclosure for reversing the image of a golfer on said platform to the cameras thereby enabling the cameras to project a direct positive image of the golfer onto the photo-sensitized surface of the visual aid blank feed to the exposure chamber;
control means responsive to movement of the golf club head from the hitting surface during an initial portion of the back swing to activate the shutter operating means to sequentially project positive images of the golfer onto different areas of the photosensitive surface to form a plurality of positive latent images thereon during the golfer's back swing, down swing and follow through;
means for releasing the exposed visual aid blank from the exposure chamber and transferring it to a developing section contained within the enclosure;
means for developing the exposed visual aid blank in the developing section; and
means for presenting the developed visual aid blank for access by the golfer.

3,918,074
FILM TRANSPORTING MECHANISM FOR STILL CAMERAS

Hubert Hackenberg, and Siegfried Zobel, both of Munich, Germany, assignors to Agfa-Gevaert AG, Leverkusen, Germany

Filed Mar. 21, 1974, Ser. No. 453,374
Claims priority, application Germany, Mar. 27, 1973, 2315097
Int. Cl.² G03B *1/00*
U.S. Cl. 354—213 **25 Claims**



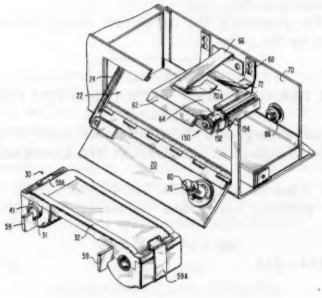
1. In a photographic apparatus, particularly in a still camera for use with photographic roll film having a row of perforations, one for each film frame, a combination comprising a housing having a chamber for a supply of film; film transporting means including input means arranged to perform a plurality of successive movements to thereby effect the transport of film in said housing by the length of a frame, said movements

including a first movement in a first direction from a starting position to an end position and said film transporting means further comprising means for moving the film through a distance less than the length of a frame during said first movement of said input means; return means for imparting to said input means a second movement from said end position in a second direction toward an intermediate position which is sufficiently remote from said starting and end positions to allow for visual determination that said input means does not occupy one of said starting and end positions, said movements of said input means further including a third movement from said intermediate position in said first direction through a distance which is sufficient to enable said film moving means to complete the transport of film by the length of a frame, and a fourth movement of said input means under the action of said return means back to said starting position; control means for automatically terminating said second movement of said input means in said intermediate position; and means for moving said control means to an inoperative position during one of said third and fourth movements of said input means so that said input means is free to move in said second direction beyond said intermediate position and all the way back to said starting position during said fourth movement thereof.

3,918,075
CAMERA AND FILM MAGAZINE THEREFOR

Donald N. Horn, Huntington, and Rein S. Randmae, Fort Salonga, both of N.Y., assignors to First Foto, Inc., St. Louis, Mo.

Filed Apr. 8, 1974, Ser. No. 459,332
Int. Cl.[2] G03B *1/00*
U.S. Cl. 354—213 **8 Claims**



1. In a camera assembly suitable for operation by an operator having minimal photographic skills, the camera assembly including a housing to be mounted above an object to be photographed, said housing being arranged to receive a removable film magazine carrying a film supply spool and a film wind-up spool; said camera assembly comprising:

lens means mounted on said housing and being aimed downwardly therefrom;

a magazine receiving compartment having:

aperture means disposed above said lens means,

a door selectively openable to expose the interior of said compartment and permit generally horizontal insertion of said film magazine into said compartment;

said door including manually operable first drive means rotatably connectible with the wind-up spool of an installed magazine, and

spring means for retaining said magazine in proper alignment relative to said aperture means,

means for selectively uncovering said lens including:

an actuator manually shiftable between a cocked position and a triggering position, and

second drive means drivingly connectible to the wind-up spool of the installed magazine for shifting said actuator to a cocked position in response to rotation of said first drive means;

metering means drivingly connected so as to be driven in response to advancement of said film;

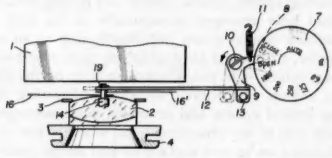
said metering means including stop means automatically shiftable to a safety position in response to predetermined advancement of said film to prevent further film advancement; and

manually operable synchronizing means for releasing said stop means from its safety position to permit further advancement of said film in the event of premature movement of said stop means to said safety position.

3,918,076
LIGHT SHIELD ARRANGEMENT FOR AN EYEPIECE SYSTEM OF A SINGLE LENS REFLEX CAMERA HAVING AN ELECTRONIC SHUTTER

Tetsuji Shono, Ranzon, Japan, assignor to Asahi Kogaku Kohyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 369,532, June 13, 1973, abandoned. This application Sept. 9, 1974, Ser. No. 504,555
Claims priority, application Japan, June 19, 1972, 47-71350
Int. Cl. G03b *13/02*
U.S. Cl. 354—219 **6 Claims**



1. In a single lens reflex camera having an electronic shutter including a knob for setting a shutter speed and, alternatively, for setting the shutter in its automatic setting range, a dial on said knob for indicating the shutter speeds and the automatic setting range, and a lens, an improved eyepiece assembly which comprises:

an eyepiece;

an eyepiece frame; and

light shield means operatively interconnected to said knob, said light shield being movable between an opened condition and a closed condition wherein said light shield is disposed between said lens and said eyepiece, said knob having opened and closed positions when set in said automatic setting range, said opened and closed positions of said knob corresponding, respectively, to the opened and closed conditions of said light shield, said opened and closed positions of said knob being indicated on said dial.

3,918,077
TRANSLATIONAL SHUTTER SYSTEM

John S. Burton, Los Angeles, and Ronald L. Whitney, San Fernando, both of Calif., assignors to Terminal Data Corporation, Woodland Hills, Calif.

Filed May 6, 1974, Ser. No. 467,525
Int. Cl.[2] G03B *9/36*
U.S. Cl. 354—234 **9 Claims**

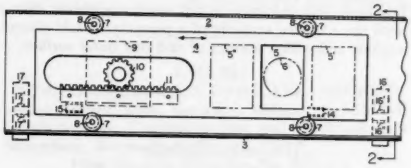
1. A translational bi-directional shutter system comprising:

a. a shutter blade (4) having an aperture (5),

b. means to reciprocate (9,10,11) said blade transversely of an optical path to selectively moved said aperture into and out of alignment with said optical path to define open closed positions respectively.

c. plural sensors (**16,17**) spaced to sense the position of said blade, and

d. logic means (**35-56**) controlled by said sensors to actuate said means to reciprocate said blade,



whereby said blade is selectively translated from a first closed position to said open position with respect to said optical path,

thereafter farther to a second closed position,

and thereafter to selectively repeat this sequence with the blade moving in the opposite direction.

3,918,078

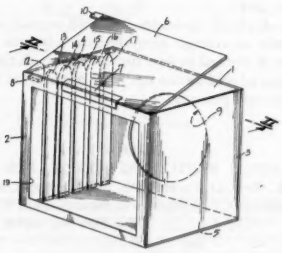
CAMERA MAT BOX

David K. Savage, Stratford, N.J., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Apr. 8, 1974, Ser. No. 458,660

Int. Cl.[2] G03B *17/00*

U.S. Cl. 354—296 **2 Claims**



1. A camera mat box, comprising

a box of substantially rectangular parallelepiped configuration having a first pair of parallel sides, a second pair of parallel sides perpendicular to the first pair of sides, a bottom and an open top;

a lid hingedly affixed to the top edge of one of the sides;

magnetic latch means in the box for keeping the lid closed;

an aperture formed through one of the sides of the first pair of sides;

a square opening having a diagonal greater than the diameter of the aperture formed through the other of the first pair of sides; and

slot means in the box along both of the second pair of sides for supporting a plurality of mats in desired ones of a plurality of positions parallel to the first pair of sides at desired spaces from the aperture.

3,918,079

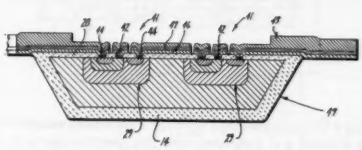
ENCAPSULATED BEAM LEAD CONSTRUCTION FOR SEMICONDUCTOR DEVICE AND ASSEMBLY AND METHOD

Albert P. Youmans, Cupertino, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 108,972, Jan. 22, 1971, abandoned, which is a continuation of Ser. No. 748,070, July 26, 1968, abandoned. This application May 31, 1974, Ser. No. 475,127

Int. Cl.[2] H01L *27/12, 29/06, 29/52*

U.S. Cl. 357—49 **12 Claims**



1. In a semiconductor device, a body of semiconductor material having a planar upper surface, a bottom surface and side wall surfaces, at least one active circuit element formed in said body by junctions which extend to said surface, a layer of insulating material carried by the body and overlying said upper surface, lead means carried by the body and extending through said layer of insulating material and making contact with the active circuit element and extending from the body and having outer ends free of the body and the layer of insulating material, an additional continuous layer of insulating material in intimate contact with the bottom surface and the side wall surfaces of said body and in intimate contact with said first named layer of insulating material to encapsulate said body, said additional layer of insulating material and said first named layer of insulating material in combination being in intimate contact with said lead means exclusively on the bottom surfaces thereof in the regions where said lead means extend from the body whereby said additional layer of insulating material provides additional support for said first named layer of insulating material to prevent breaking of said first named layer of insulating material and to thereby prevent said lead means from coming in contact with the body in the regions where said lead means extend from the body, said additional layer of insulating material being surrounded by air.

3,918,080

MULTIEMITTER TRANSISTOR WITH CONTINUOUS BALLAST RESISTOR

George Kerr, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 153,827, June 16, 1971, abandoned, which is a continuation of Ser. No. 806,894, March 13, 1969, abandoned. This application July 12, 1973, Ser. No. 378,589

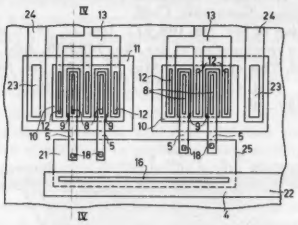
Claims priority, application Netherlands, June 21, 1968, 6808722

Int. Cl.[2] H01L *29/52, 29/72, 49/02*

U.S. Cl. 357—36 **10 Claims**

1. A semiconductor device comprising a semiconductor body having a substantially plane surface, said body comprising plural regions adjacent the surface of at least one circuit element, an insulating layer on the body surface, a common contact on said insulating layer and laterally spaced from said regions, a plurality of spaced finger connections on the insulating layer, said fingers making contact with said regions through holes in the insulating layer, and means forming a resistor in series between the common contact and each of the finger connections, said resistor forming means comprising a continuous resistance layer separated from said regions and laterally spaced from said holes in the insulating layer, said common contact being connected to one portion of the resistance layer, said finger connections being connected to other portions spaced from said one portion of the resistance layer,

said resistance layer further comprising a first semiconductor surface region in the body completely surrounded by a second semiconductor region, the second semiconductor region



forming a first *p-n* junction with the first semiconductor region and a second *p-n* junction with the underlying part of the semiconductor body, and means being provided to short-circuit at least one of the first and second *p-n* junctions.

3,918,081

INTEGRATED SEMICONDUCTOR DEVICE EMPLOYING CHARGE STORAGE AND CHARGE TRANSPORT FOR MEMORY OR DELAY LINE

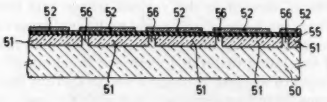
Frederik Leonard Johan Sangster, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 817,690, April 21, 1969, abandoned. This application Aug. 19, 1971, Ser. No. 173,249

Claims priority, application Netherlands, Apr. 23, 1968, 6805705

Int. Cl.[2] H01L *27/10, 29/76;* **H03k** *21/00;* **H03K** *23/00*

U.S. Cl. 357—24 **45 Claims**



1. A charge transferring device comprising a semiconductor body having a surface, an insulating layer on the semiconductor body surface, a plurality of spaced conductive layers on said insulating layer, conductive layers of said plurality forming with underlying regions of said body and the intervening insulating layer portion a plurality of succeeding capacitive storage means, and means for applying alternating control voltages to at least some of said conductive layers for causing charge stored in a plurality of first storage means to transfer substantially only to succeeding second storage means by electric field effect in the body.

3,918,082

SEMICONDUCTOR SWITCHING DEVICE

Jearld L. Hutson, 907 Newberry, Richardson, Tex. 75080

Filed Nov. 7, 1973, Ser. No. 413,539

Int. Cl. H01l *11/10*

U.S. Cl. 357—38 **14 Claims**

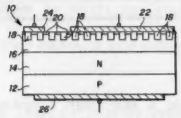
1. A semiconductor device comprising:

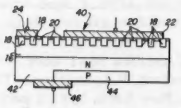
a body of semiconductor material having three layers including an internal layer of one conductivity type bounded on opposite sides by two layers of the opposite conductivity type to form a plurality of P-N junctions, said body having first and second opposed outer surfaces of said opposite conductivity type,

an array of discrete regions of said one conductivity type spaced apart over substantially the entire area of said first outer surface of said body, said discrete regions having symmetrical cross sections in planes parallel to said outer surfaces and extending inwardly from said first outer surface into the interior of one of said layers of opposite conductivity type,

a layer of highly doped semiconductor material of said opposite conductivity type formed over said first outer surface of said body and extending between and surrounding said discrete regions,

a first large area electrode in low resistance ohmic contact with the exposed surfaces of a plurality of said discrete regions and with a portion of said first outer surface,





a second electrode connected to said first outer surface and a plurality of said discrete regions and spaced apart from said first electrode such that at least one vertical P-N junction exists between said first and second electrodes, a source of control bias connected to said second electrode, and

a third electrode connected to said second outer surface, wherein a voltage drop occurs adjacent said regions which is normal to said outer surfaces during initial conduction of said device upon the application of a predetermined bias potential.

3,918,083

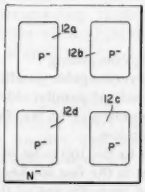
BILATERAL SWITCHING INTEGRATED CIRCUIT

Bernard L. Kravitz, Forest Hills, and George R. Seaton, Northport, both of N.Y., assignors to Dionics, Inc., Westbury, N.Y.

Filed Aug. 22, 1974, Ser. No. 499,534

Int. Cl.[2] H01L *29/747*

U.S. Cl. 357—39 **17 Claims**



1. A planar integrated circuit semiconductive device comprising:

a body of semiconductive material of a first conductivity type having two major surfaces;

four base zones of opposite conductivity type material within said body forming PN junctions reaching one said surface;

an emitter zone of said first conductivity type material located entirely within each of said four base zones and forming PN junctions reaching said one surface;

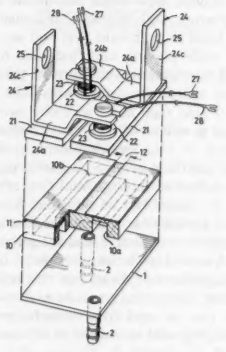
said respective base and emitter zones forming with said body four transistors sharing a common collector; and

four conductive leads connecting base and emitter zones on said surface between adjacent pairs of said transistors.

3,918,084
SEMICONDUCTOR RECTIFIER ARRANGEMENT

Winfried Schierz, Roth, Germany, assignor to SEMIKRON Gesellschaft fur Gleichrichterbau und Elektronik m.b.H., Nuremberg, Germany

Filed Nov. 19, 1974, Ser. No. 525,313
Int. Cl.² H01L 25/04
U.S. Cl. 357—82 **8 Claims**

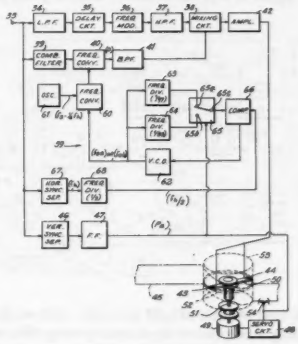


1. A semiconductor rectifier arrangement comprising in combination: two semiconductor rectifier wafers, at least one of which is a controllable rectifier; a cooling element which is provided with a cooling channel for the passage of a liquid coolant and on which said rectifiers are mounted, said cooling element being formed of two components with one of said components being a flat metal base body and the other of said components being a flat cover of an insulating material with good thermal conductivity which is fastened to the upper surface of said base body; one of said components being provided, in the surface thereof which abutts the other of said components, with a recess which together with the adjacent surface of said other component forms said cooling channel; means formed in said base body and communicating with said cooling channel, for the connection of coolant lines to said cooling channel; an intermediate metal layer, which is subdivided into a plurality of layer portions, covering at least one areal section of the upper surface of said cover which is provided at a small distance from and overlies said cooling channel; each of said rectifier wafers being mounted on and having one contact surface thereof permanently electrically connected to one of said layer portions and having its opposite upper contact surface electrically connected to a conductor which is disposed on an adjacent one of said layer portions; and a mass of an insulating material incapsulating said conductors, said rectifier wafers and said cooling element.

3,918,085
MAGNETIC RECORDING AND/OR REPRODUCING APPARATUS

Toshihiko Numakura; Kazuo Yamagiwa, both of Tokyo, and Akira Saito, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 10, 1975, Ser. No. 539,997
Claims priority, application Japan, Jan. 12, 1974, 49-6845
Int. Cl.² H04N 5/79
U.S. Cl. 358—4 **30 Claims**



1. In apparatus by which periodic information signals having an original carrier frequency are recorded in successive parallel tracks on a record medium, and in which frequency converting means receives said information signals with said original carrier frequency and first and second frequency converting signals are alternately applied to said frequency converting means for causing the latter to convert the carrier of said information signals to different first and second carrier frequencies with which the information signals are recorded in tracks that are next adjacent to each other: a circuit for producing said first and second frequency converting signals comprising a phase-locked loop including a voltage-controlled variable frequency oscillator for producing an output signal at a frequency determined at least by a control voltage applied thereto, means for producing a reference signal, comparator means receiving predetermined ratios of said output signal and said reference signal, respectively, and comparing the same to provide said control voltage for the voltage-controlled oscillator, and means selectively providing first and second values of one of said ratios which values respectively correspond to said first and second frequency converting signals; and control means selecting said first and second values of said one ratio during the recording of said information signals in said tracks that are next adjacent each other.

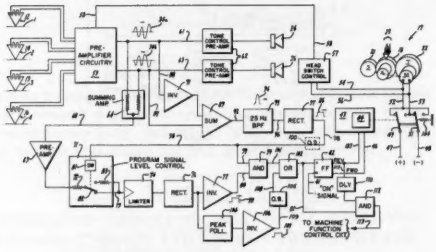
3,918,086
TAPE ELEMENT, SYSTEM AND METHOD FOR REVERSAL OF TAPE MOVEMENT DURING LOW SOUND LEVELS

James W. F. Blackie; Gregory J. Maleski, both of Sunnyvale; Chester W. Newell, San Jose, and Charles A. Vogel, Sunnyvale, all of Calif., assignors to American Videonetics Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 42,278, June 1, 1970, abandoned, which is a continuation-in-part of Ser. No. 648,665, June 26, 1967, Pat. No. 3,573,393. This application Sept. 21, 1971, Ser. No. 182,562
Int. Cl.² G11B 5/027, 15/18, 5/78
U.S. Cl. 360—55 **6 Claims**

1. As an article of manufacture a length of pliable recording tape having a first elongated record channel, recorded manifestations of electrical signals in said first channel representative of a first portion of a reproducible program and adapted

to be transduced in a first direction of movement of the tape, a second elongated record channel, recorded manifestations of electrical signals in said second channel representative of a second portion of the same said reproducible program adapted to be transduced in a second direction of movement of the tape opposite said first direction, the manifestations representing the end of said first portion being disposed at substantially the same position along the length of said tape as the manifestations representing the beginning of said second portion, and recorded means carried by the tape for providing a control signal at a predetermined limited point prior to the



end of the first portion of said program, said recorded means for providing said control signal comprising first and second portions of recorded manifestations representative of a substantially predetermined frequency, the control signal portions being substantially 180 electrical degrees out of phase and disposed and adapted to be transduced simultaneously, the recorded manifestations of said first portion of said program including, at a point along said first channel disposed to be transduced subsequent to said control signal, recorded manifestations of electrical signals representative of the program and falling below a predetermined level to define the end of said first program portion.

3,918,087

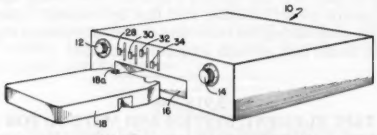
TWO CHANNEL AND FOUR CHANNEL, EIGHT TRACK TAPE PLAYER

Hugo Korn, Chicago, Ill., assignor to Motorola, Inc., Chicago, Ill.

Continuation of Ser. No. 19,927, March 16, 1970. This application Nov. 29, 1971, Ser. No. 203,075

Int. Cl.[2] G11B *15/12, 5/008, 5/55*

U.S. Cl. 360—61 **3 Claims**



1. A multi-track tape player system comprising in combination:

magnetic tape head means having four transducer portions formed thereon;

tape transport means for supporting and transporting a multi-track magnetic tape of first or second kinds in operative spaced relation to said magnetic tape head, said multi-track magnetic tape including eight tracks formed thereon, said eight tracks being divided into two programs each containing four channels for said first kind of tape and said eight tracks being divided into four programs each containing two channels for said second kind of tape, with predetermined ones of said tracks on the tape in registry with said transducer portions;

actuating means including a cam operable at the end of a program for moving said magnetic tape head means in a direction transverse to the direction of tape travel to shift said magnetic tape head means alternately between only first and second positions,

switch means including first contact means rotatably connected to said cam and second contact means fixed in a spaced relation to said first contact means, said second contact means having a first circuit portion for connection in circuit with said transducer portions of said magnetic tape head to render only a selected two of said four transducer portions active, said second contact means further having a second circuit portion for connection in circuit with said transducer portions of said magnetic tape head to render the other two of said four transducer portions active; said first contact means engaging said second contact means with the rotation of said cam for selectively connecting said first and second circuit portions thereof to a reference potential through said cam; and

mode switch means having first and second positions for controlling the activation of said four transducer portions of said magnetic tape head, said mode switch means in said first position activates all four transducer portions of said tape head in both said first and second positions of said cam while playing said first kind of tape, and said mode switch means in said second position connecting said switch means in circuit with said four transducer portions of said tape head whereby two successive first and second positions of said cam connects said first circuit portion of said switch means in circuit with said transducer portions of said magnetic tape head and the reference potential through said first contact means and said cam to render two of said four transducer portions active, and another two successive first and second positions of said cam connects said second circuit portion of said switch means in circuit with said transducer portions of said magnetic tape head and the reference potential through said first contact means and said cam to render the other two of said four transducer portions active thereby playing said second kind of tape.

3,918,088

POWER SUPPLY CIRCUIT FOR VARYING THE BIAS SIGNAL TO A MAGNETIC HEAD

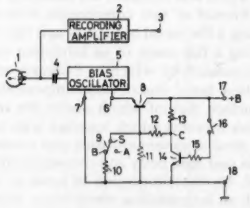
Hideo Tabuchi, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed June 3, 1974, Ser. No. 475,514

Claims priority, application Japan, June 9, 1973, 48-68404

Int. Cl.[2] G11B *5/47, 5/02*

U.S. Cl. 360—66 **2 Claims**



1. Means for varying the bias signal to a magnetic head comprising, a variable gain bias oscillator connected to said magnetic head and having a gain control input terminal, a control transistor with one of its electrodes connected to said gain control terminal, a bias voltage source with one side connected to a second electrode of said control transistor, a first resistor connected between the third control electrode of said control transistor and the other side of said bias voltage

source, a first switch and a second resistor connected in series and the combination connected in parallel with said first resistor and third and fourth resistors connected in series between said one side of said bias voltage source and said third control electrode of said control transistor.

3,918,089

APPARATUS FOR ERASING MAGNETIC RECORDS OF THE SPIRAL SCANNING TYPE

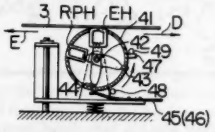
Saburo Kato, Yokohama, and Isao Yamada, Chigasaki, both of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 361,784, May 18, 1973, abandoned. This application Oct. 21, 1974, Ser. No. 516,665

Claims priority, application Japan, May 26, 1972, 47-52620

Int. Cl. G11B *5/47, 5/54, 5/25*

U.S. Cl. 360—66 **6 Claims**



1. Apparatus for magnetically recording and reproducing signals on a spiral track on a surface of a magnetic sheet, including

a. means for retaining a magnetic sheet in a fixed position;
b. a magnetic transducer head;
c. means for selectively advancing said head in either of two directions along a spiral track on a surface of a magnetic sheet disposed in said fixed position;
d. signal circuit means energizing said head for recording on and reproducing from said magnetic sheet during movement of said head in a first of said two directions; and
e. manually operable means for reversing the direction of advance of said head along said spiral track;

wherein the improvement comprises

f. selectively operable erase means energizing said head with an electric current of magnitude to erase signals recorded on said spiral track during movement of said head in the other of said two directions;
g. said head including a first gap-defining core means for tracing a spiral track of predetermined transverse width when said head is energized by said signal circuit means during advance in said first direction on said surface,
h. and said head further including a second gap-defining core means for tracing a spiral track coincident with but greater in transverse width than said last-mentioned spiral track when said head is energized by said erase means during advance in said other direction on said surface.

3,918,090

SWITCHING ARRANGEMENT FOR THE AUTOMATIC DETECTION OF A RECORDABLE POINT ON A MOVING RECORDING CARRIER

Martin Ludwig, Munich; Rudolf Queisser, Geretsried, and Hubert Schlossbauer, Krailling, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Dec. 18, 1974, Ser. No. 533,854

Claims priority, application Germany, Dec. 20, 1973, 2363570

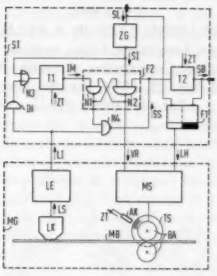
Int. Cl.² G11B *15/52, 15/22, 15/06*

U.S. Cl. 360—72 **12 Claims**

1. A switching arrangement for automatically detecting an information-free recordable location on a moving recording carrier which has spaced information blocks recorded thereon, a carrier drive mechanism operable to selectively move the carrier in forward and reverse directions and a reading device operable to produce reading pulses in response to the movement of information stored on the carrier past the reading device, said arrangement comprising:

first means connected to the carrier drive mechanism to control the direction of carrier movement and operable in response to receipt of a search signal to cause movement of the carrier in the forward direction;

second means connected to the reading device and to said first means and operable after a predetermined interval from a last reading pulse of an information block to cause said first means to reverse the operation of the drive mechanism, and operable in response to renewed detection of reading pulses with the carrier moving in the reverse direction to again cause said first means to reverse operation of the drive mechanism to move the carrier in the forward direction; and



third means connected to the reading device and to said first means and operable after a second predetermined interval after the renewed movement of the carrier in the forward direction to provide a readiness signal to indicate an information-free recordable location and to cause said first means to stop the operation of the drive mechanism.

3,918,091

DEVICE FOR CONTROLLING THE POSITION OF A MAGNETIC HEAD WITH RESPECT TO AN INFORMATION TRACK TO BE FOLLOWED

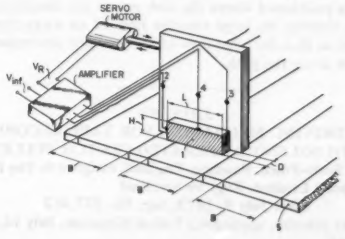
Anthonie Walraven; Jacob Koorneef, and Jan Antoon Ludolf Potgiesse, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed July 9, 1974, Ser. No. 486,772

Claims priority, application Netherlands, July 10, 1973, 739590

Int. Cl.² G11B *21/10, 21/20, 5/48, 5/56*

U.S. Cl. 360—77 **4 Claims**



1. A device for the automatic control of the position of a magnetic playback head with respect to a selected information track of a number of information tracks recorded on a magnetic recording medium, which device comprises a magnetic playback head for reading a selected information track of a number of information tracks recorded on a magnetic recording medium track, means controlled by an error signal for moving the head to arrange it centrally on the track, an elon-

gate sensing element of magnetoresistance material which has a first and a second end tap and a center tap and the length of which corresponds to the track width of the information tracks in said recording medium, the difference between the voltage across the first end tap and the center tap and the voltage across the second end tap and the center tap being indicative of the position of the playback head with respect to the recorded information track and means for converting said voltage difference into said error signal.

3,918,092

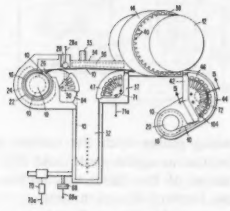
PUSH-THREADING TAPE IN A HELICAL PATH

William J. Rueger, Longmont, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 25, 1974, Ser. No. 464,260

Int. Cl.² B65H *17/32*

U.S. Cl. 360—85 **7 Claims**



1. Apparatus for threading a web from a supply spool along a circuitous path having physical and pneumatic boundaries to guide the web during threading without impeding movement of the web, said apparatus comprising:

means for rotating the spool forward to supply the web to the circuitous path;

means mounted adjacent the spool for picking the web leading edge off of the spool and directing the leading edge into the circuitous path;

means mounted adjacent the spool for directing a large flow of air in a circular motion about the spool in the direction of forward web motion;

means mounted adjacent the spool for confining the large circular flow of air to a region immediately adjacent the outer wrap of the web on the spool, the flow of air being large enough in cooperation with said confining means to restrain the uncoiling of the web about the spool whereby forward rotation of the spool pushes the web along the circuitous path rather than uncoiling the web;

means positioned where the web enters the circuitous path for venting the large circular flow of air away from the web so that the large flow of air does not accompany the web along the path.

3,918,093

TAPE DRIVING MECHANISM FOR TAPE RECORDERS WITH SOLENOID OPERATED CLUTCH PULLEYS

Vernon Seale-Finch, Reading, England, assignor to The Plessey Company Limited, Zug, Switzerland

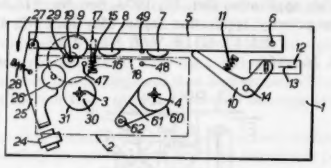
Filed July 9, 1973, Ser. No. 377,462

Claims priority, application United Kingdom, July 14, 1972, 33058/72

Int. Cl.² G11B *5/54*; H02K *49/10*

U.S. Cl. 360—96 **9 Claims**

1. Tape recording and/or playback apparatus comprising a pair of splined spindles spaced apart so as to receive a tape cassette, drive pulleys disposed coaxially with respect to the spindles, one for each spindle, transmission means via which the spindles are coupled continuously to receive, in operation of the apparatus driving torque from a motor and two solenoid operated face plate clutches one for each pulley, for mechanically coupling one or other of the drive pulleys coaxially in driving engagement with its associated spindle so as to effect fast tape wind or re-wind in accordance with which one of the said clutches is engaged, said apparatus also comprising a pinch roller, a magnetic head assembly, a carrier arm supporting the pinch roller and magnetic head assembly in spaced apart relationship, a further solenoid operatively associated with the carrier arm, a pivot about which the carrier arm is moved consequent upon operation of the solenoid, the magnetic head assembly and pinch roller being arranged on a



common radial line through the pivot and to one side of the pivot, a capstan, a flywheel coupled coaxially with the capstan, and a motor for driving the capstan, the arrangement being such that when the carrier arm is moved consequent upon operation of the further solenoid the magnetic head assembly is brought into contact with magnetic tape carried in a tape cassette and the pinch roller is moved so that the tape is pinched for driving purposes between the pinch roller and the capstan, the axis of the pinch roller being fixed with respect to the axis of the capstan when these parts are brought together for driving the tape.

3,918,094

TEACHING DEVICE EMPLOYING MAGNETIC TAPE WITH LEGENDS AND CONTAINED IN A SPECIAL CASSETTE

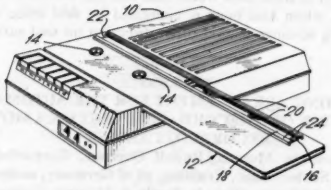
Adrian Francis Rudd, 29 Bar Lane, Stapleford, Cambridge, England

Filed May 21, 1974, Ser. No. 471,981

Claims priority, application United Kingdom, May 29, 1973, 25421/73

Int. Cl.² G11B *23/38*, *23/44*, *15/60*, *23/04*

U.S. Cl. 360—96 **8 Claims**



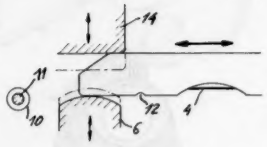
1. In combination a magnetic recording tape having audio information recorded thereon and having applied to one side thereof legends corresponding to the recorded information for visually representing the information as the sounds thereon are heard during playback, a cassette, two reels within the cassette for containing and taking up the tape respectively the two reels being sandwiched between upper and lower housing walls, at least one window formed in the upper housing wall and guide means in the housing for causing the tape to be stretched below the window whereby the legends on the tape can be seen through the window as they pass therebelow during transition of the tape from one reel to the other.

3,918,095

CASSETTE FOR A BAND-SHAPED MAGNETIC RECORDING SUPPORT

Marcel Jules Helene Staar, 479 Avenue Louise, Brussels, Belgium

Continuation of Ser. No. 36,065, May 11, 1970. This application Nov. 6, 1972, Ser. No. 304,270
Claims priority, application Belgium, May 9, 1969, 73282
Int. Cl.[2] G11B 23/10
U.S. Cl. 360—132 18 Claims



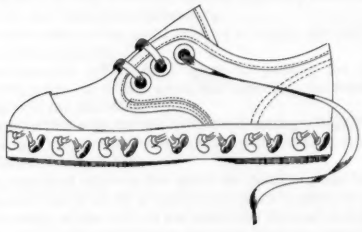
1. A cassette for an endless band-shaped magnetic recording tape adapted for insertion into a playback device having a playback head for contacting the tape, a part movable relative to said playback head, said cassette being insertable between said playback head and said movable part, and driving means for moving the tape relative to the playback head; comprising an elongated core having at least two parallel surface portions; a housing including complementary upper and lower cover portions encasing said core, said housing having internal dimensions providing for clearance about the parallel surface and end portions of said core; said recording tape being wound around the said core extending about the parallel surface and end portions of said core and being longitudinally slidable relative thereto; a first aperture in one of said cover portions extending across the width of said housing providing ingress to said playback head to contact said tape for playing the recordings on the tape; a second aperture in said last-mentioned cover portion extending from the leadiing transverse edge portion insertable into the playback device longitudinally a short distance along said cover portion for ingress of said driving means into said hoousing for engaging and moving said tape relative to the playback head, and said housing having along the leading edge of the cassette which engages in the playback device a beveled configuration facilitating insertion between said playback head and said movable part of the playback device in a manner facilitating insertion of said cassette into said playback device in a mode whereby its surface having the first aperture is on the same side as the playback head and preventing insertion of the cassette in any other orientation.

DESIGNS

NOVEMBER 4, 1975

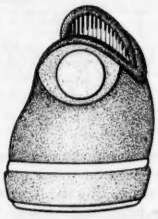
237,423
ATHLETIC SUPPORT OR THE LIKE
Max A. Gulack, 880 5th Ave., New York, N.Y. 10021
Filed June 22, 1973, Ser. No. 372,512
Term of patent 14 years
Int. Cl. D2—*01*
U.S. Cl. D2—11

237,424
SHOE
Bernd Hannemann, Belcamp, Md., assignor to Bata Shoe Company, Inc., Belcamp, Md.
Filed May 17, 1974, Ser. No. 471,172
Term of patent 3½ years
Int. Cl. D2—*04*
U.S. Cl. D2—278

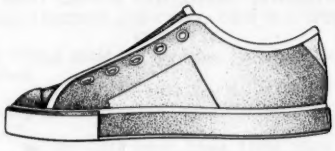


237,425
SHOE
Aubrey Askew, Southport, England, assignor to Dunlop Limited, London, England
Filed June 26, 1973, Ser. No. 373,865
Claims priority, application Great Britain Jan. 20, 1973
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—310

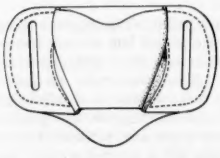
237,426
SHOE
William H. Thornberry, Newtown, Conn., assignor to Uniroyal, Inc.
Filed July 26, 1974, Ser. No. 492,188
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—310



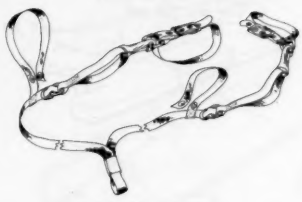
237,427
SHOE
William H. Thornberry, Newtown, Conn., assignor to Uniroyal, Inc.
Filed July 26, 1974, Ser. No. 492,307
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—310



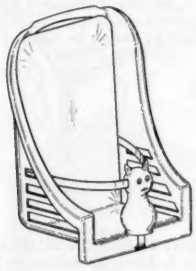
237,428
HANDCUFF HOLDER
Roy L. Baker, Rte. 1, Box 245, Magnolia, Ark. 71753
Filed Apr. 1, 1974, Ser. No. 456,910
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—381



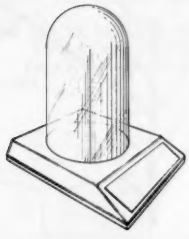
237,429
ARM RESTRAINING STRAP FOR AUTO RACING
Steve A. Bolan, 1925 W. 2nd Place,
Mesa, Ariz. 85201
Filed Aug. 16, 1973, Ser. No. 388,885
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—381



237,430
INFANT SEAT
Robert Lerner, Roslyn, N.Y., assignor to Johnee Seat Corporation, Long Island City, N.Y.
Filed July 26, 1973, Ser. No. 382,814
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—7



237,431
DISPLAY STAND OR THE LIKE
Donald L. Dean, 9331 Pioneer Blvd., Apt. 103,
Santa Fe Springs, Calif. 90670
Filed Apr. 5, 1974, Ser. No. 458,337
Term of patent 14 years
Int. Cl. D20—*02*; XD6—*04*
U.S. Cl. D6—20

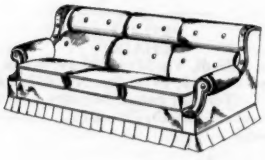


237,432
MULTI-SHELVED FLOOR STAND DISPLAY OR SIMILAR ARTICLE
Ronald H. Taub, Highland Park, Ill., assignor to Taub Family Trust
Filed Apr. 29, 1974, Ser. No. 465,104
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—23

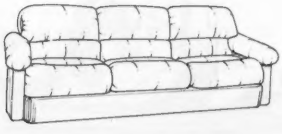
237,433
CHAIR
Giovanni Offredi, Via Muratori 29, Milan, Italy
Filed Mar. 18, 1974, Ser. No. 452,414
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—55

237,434
BENCH
Robert C. Le May, Jr., 410 4th St., East Greenville, Pa. 18041
Filed Jan. 21, 1974, Ser. No. 434,930
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—60

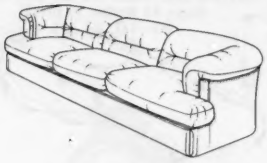
237,435
FURNITURE SEAT
Burton H. Kaplan, Potomac, Md., assignor to Rowe Furniture Corporation, Salem, Va.
Filed May 7, 1974, Ser. No. 467,804
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



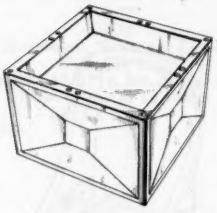
237,436
SEAT
Frank A. Warren, Denville, N.J., assignor to Futorian Corporation, Amsterdam, N.Y.
Filed May 28, 1974, Ser. No. 473,611
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



237,437
SEAT
David P. G. Williams, New York, N.Y., assignor to Futorian Corporation, Amsterdam, N.Y.
Filed May 28, 1974, Ser. No. 474,120
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63

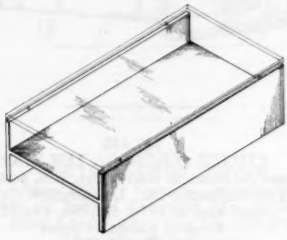


237,438
DISPLAY BLOCK
Robert W. Cripe, 339 E. Floral Ave., Arcadia, Calif. 91006
Filed Apr. 18, 1974, Ser. No. 461,927
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—85

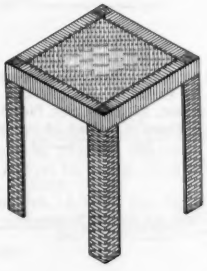


237,439
DRAWING TABLE OR SIMILAR ARTICLE
Charles B. Kiser, 17 Baltimore Place NW., Atlanta, Ga. 30308
Filed Mar. 25, 1974, Ser. No. 454,459
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—156

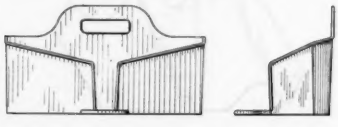
237,440
TABLE OR THE LIKE
Ronald J. McDonald, New Rochelle, N.Y.
(76—59 264th St., Floral Park, N.Y. 11004)
Continuation of design application Ser. No. 22,539, Apr. 20, 1970, which is a continuation of design applications Ser. Nos. 18,146, 18,147, 18,148, and 18,149, all June 18, 1969. This application June 6, 1972, Ser. No. 260,349
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—175



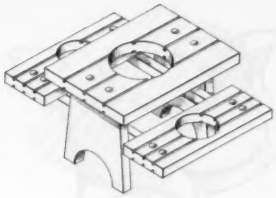
237,441
TABLE
Leonard V. Birnbaum, Highland Park, Ill., assignor to Burwood Products Company, Chicago, Ill.
Filed July 2, 1973, Ser. No. 375,485
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177



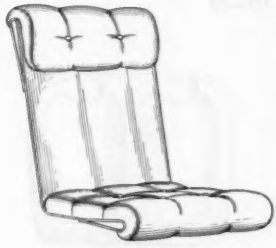
237,442
CLOTHES HANGER HOLDER
Neal B. Kiggens, 777 E. Barstow, Suite C 93710, and Dan H. Landon, 222 W. Shaw, Suite 103 93704, both of Fresno, Calif.
Filed Apr. 22, 1974, Ser. No. 462,866
Term of patent 14 years
Int. Cl. D6—*99*; XD6—*04*
U.S. Cl. D6—181



237,443
SUPPORT FOR POTTED PLANTS
Marvin H. Nelson, 4600 Sierrawood Lane, Pleasanton, Calif. 94566
Filed Oct. 29, 1974, Ser. No. 518,894
Term of patent 14 years
Int. Cl. D6—*03, 06*
U.S. Cl. D6—182

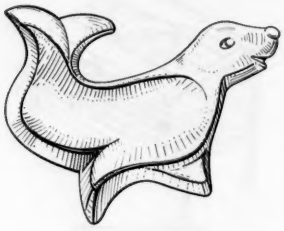


237,444
PADDED TUNIC CHAIR BODY
Gerry D. Welton, 910 E. Tripp, Peoria, Ill. 61603
Filed May 1, 1973, Ser. No. 356,106
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—197

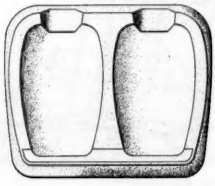


237,445
CRUET
Peter L. Schweizer, Liberty Center, Ohio, assignor to Owens-Illinois, Inc.
Filed Apr. 5, 1974, Ser. No. 458,132
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—59

237,446
IMPLEMENT HOLDER
Harold P. Ashton, Providence, R.I., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed July 25, 1974, Ser. No. 491,889
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—73



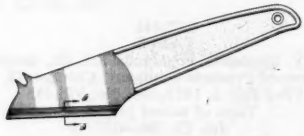
237,447
HOLDER FOR SPOONS OR THE LIKE
Harold P. Ashton, Providence, R.I., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Aug. 5, 1974, Ser. No. 494,672
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—73



237,448
WASHBOARD
William V. Sunday, 9904 Manor Ave., Cleveland, Ohio 44104
Filed Apr. 8, 1974, Ser. No. 458,542
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—201

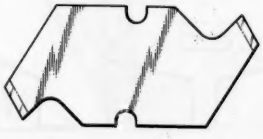
237,449
PASTRY SERVER OR THE LIKE
Edward N. Montesi, Barrington, R.I., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Aug. 5, 1974, Ser. No. 494,950
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—142

237,450
CHEESE SLICER OR THE LIKE
Edward N. Montesi, Barrington, R.I., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Aug. 5, 1974, Ser. No. 494,952
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—148

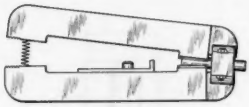


237,451
GARDEN TOOL
Richard O. Bartz, 7017 Mark Terrace Drive, Edina, Minn. 55435
Filed Dec. 13, 1974, Ser. No. 532,676
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D8—9

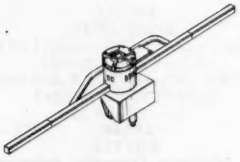
237,452
SCORING KNIFE BLADE
Brad Robert Hall, Shaftbury, Vt., and Paul Joseph Donoski, Shelton, Conn., assignors to The Stanley Works, New Britain, Conn.
Filed June 28, 1974, Ser. No. 483,957
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—20



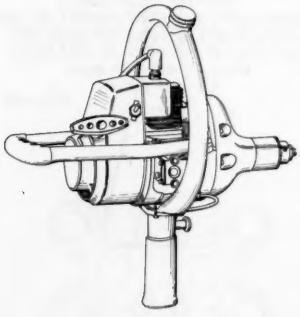
237,453
WIRE STRIPPER
Joseph Perrino, Rehoboth, Mass., assignor to Micro Electronics, Inc., Newport, R.I.
Filed Apr. 8, 1974, Ser. No. 459,128
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—56



237,454
EARTH ANCHOR DRIVER
James R. Adams, 1125 E. Vandiver, and James K. Adams, Rte. 10, both of Columbia, Mo. 65201
Filed July 17, 1974, Ser. No. 489,378
Term of patent 14 years
Int. Cl. D8—*01*
U.S. Cl. D8—67



237,455
PISTON ENGINE-POWERED DRILL MOTOR
Buford J. Schramm, 14805 S. Interstate 10, Tempe, Ariz. 85281, and Robert G. Everts, 2118 E. Birchwood Ave., Mesa, Ariz. 85204
Filed Oct. 23, 1974, Ser. No. 517,292
Term of patent 14 years
Int. Cl. D8—*01*
U.S. Cl. D8—69

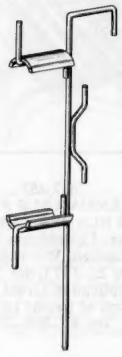


237,456
CHIPPER KNIFE FOR USE IN A WOOD CHIPPING MACHINE
James R. Ross, Cookeville, Tenn., assignor to Vistron Corporation, Cleveland, Ohio
Filed June 14, 1973, Ser. No. 369,998
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D8—90

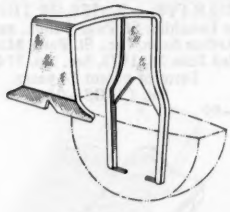
237,457
HANDLE FOR REMOVABLE PUTTY KNIFE AND SCRAPER BLADES AND THE LIKE
Ronald David Carter, Leamington Spa, England, assignor to Stanley Tools Limited, Woodside, Sheffield, England
Filed June 25, 1973, Ser. No. 373,029
Claims priority, application Great Britain Jan. 25, 1973
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—98

237,458
HOLDER FOR A KNIFE OR THE LIKE
Clayton Laughlin, St. Paul, Minn., assignor to Arthur Salm, Inc., St. Paul, Minn.
Filed June 28, 1973, Ser. No. 374,510
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—99

237,459
COMBINED SUPPORT AND REEL FOR STORING ELECTRIC CORDS AND THE LIKE
Joseph T. Wagner, Sr., 262 Tryon St., South Glastonbury, Conn. 06073
Filed May 20, 1974, Ser. No. 471,460
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D8—220



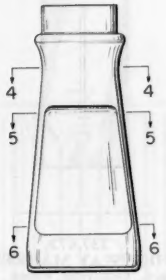
237,460
DEODORANT HANGER
Morris Bordman, 4901 Umbria St., Philadelphia, Pa. 19127
Filed Feb. 6, 1974, Ser. No. 440,237
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—246



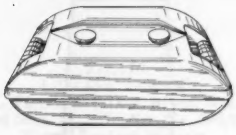
237,461
BOTTLE
Edward J. Kretz, Toledo, Ohio, assignor to Owens-Illinois, Inc.
Filed Mar. 1, 1974, Ser. No. 447,312
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—137

237,462
BOTTLE
Bernd Peters, Jesteburg, Germany, assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Mar. 8, 1973, Ser. No. 339,032
Claims priority, application Great Britain Sept. 14, 1972
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—149

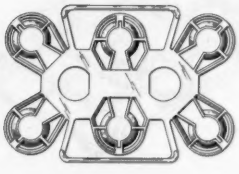
237,463
JAR
Edward J. Kretz, Toledo, Ohio, assignor to Owens-Illinois, Inc.
Filed Apr. 15, 1974, Ser. No. 460,684
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—149



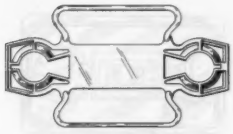
237,464
FUEL TANK
Russell H. Ciphers, 3272 Country Club Drive, Medina, Ohio 44256
Filed Feb. 8, 1973, Ser. No. 330,572
Term of patent 14 years
Int. Cl. D9—*02*
U.S. Cl. D9—175



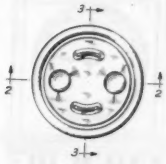
237,465
BOTTLE CARRIER
Rodney K. Calvert, Dunwoody, Ga., assignor to The Mead Corporation, Dayton, Ohio
Filed May 24, 1974, Ser. No. 473,263
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—178

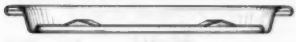


237,466
BOTTLE CARRIER
Rodney K. Calvert, Dunwoody, Ga., assignor to The Mead Corporation, Dayton, Ohio
Filed May 24, 1974, Ser. No. 473,291
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—178

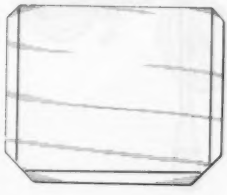


237,467
CONTAINER END
Richard Paul Nightingale, Fox River Grove, and Harlen Edgar Wilkinson, Crystal Lake, Ill., assignors to American Can Company, Greenwich, Conn.
Filed Apr. 22, 1974, Ser. No. 462,768
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—255

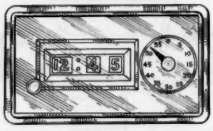




237,468
PLASTIC SLIP PALLET FOR BOXES OR THE LIKE
Richard Edwin Andrews, Arvada, and Patrick Maurice Mawe, Wheat Ridge, Colo., assignors to Adolph Coors Company, Golden, Colo.
Filed July 23, 1973, Ser. No. 381,745
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—294



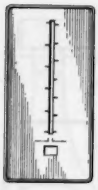
237,469
DIGITAL CLOCK WITH ANALOG SECONDS INDICATOR
Emil John Niznik, Lake Geneva, Wis., assignor to Bunker Ramo Corporation
Filed May 2, 1974, Ser. No. 466,133
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—15



237,470
CLOCK
John A. Hubley, Jr., 413 S. Cherry St., Lititz, Pa. 17543
Filed Nov. 21, 1973, Ser No. 417,762
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—28

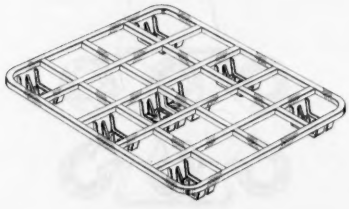
237,471
DEPTH FINDER OR SIMILAR ARTICLE
Charles A. Richmann, Northbrook, Ill., assignor to Waller Corporation
Filed Nov. 5, 1973, Ser. No. 412,591
Term of patent 7 years
Int. Cl. D10—*04*
U.S. Cl. D10—46

237,472
SUPPORT CHASSIS FOR AN ANALOG RECORDING INSTRUMENT
J. B. Shepard, 541 Kern, La Habra, Calif. 90631
Filed May 23, 1974, Ser. No. 472,842
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—46

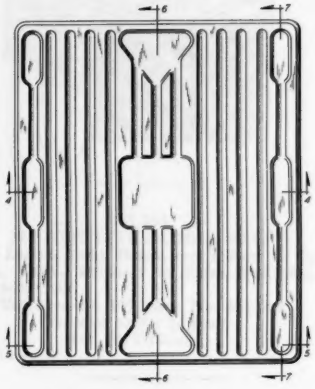


237,473
HIGHWAY MARKER
John C. Fitch, Lakeville, Conn., assignor to Fibco, Incorporated, Boston, Mass.
Filed Nov. 27, 1973, Ser. No. 419,249
Term of patent 14 years
Int. Cl. D29—*02*
U.S. Cl. D10—109

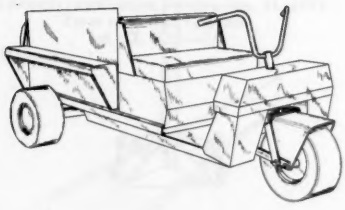
237,474
PALLET
Robert L. Tate, 2209C E. Santa Clara, Santa Ana, Calif. 92705
Filed Aug. 15, 1974, Ser. No. 497,826
Term of patent 7 years
Int. Cl. D9—*99*
U.S. Cl. D12—53



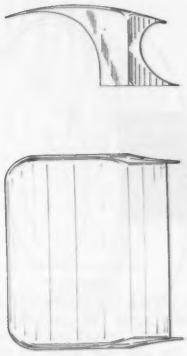
237,475
LID FOR A LOAD ON AN INDUSTRIAL PLATFORM PALLET OR THE LIKE
Charles G. Cardwell and Morris E. Speck, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.
Filed June 24, 1974, Ser. No. 482,256
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D12—60



237,476
UTILITY TRUCK
William L. Figura, R.F.D. 2, Bruce, Wis. 54819
Filed Sept. 18, 1974, Ser. No. 506,976
Term of patent 14 years
Int Cl. D12—*08*
U.S. Cl. D12—85

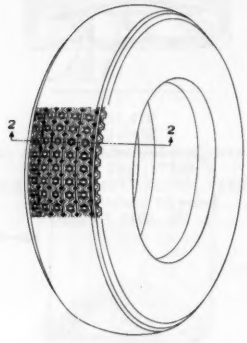


237,477
AIR DEFLECTOR FOR PICKUP TRUCKS OR THE LIKE
Giles P. Lay, 11 E. Norma St., Sulphur, Okla. 73086
Filed May 22, 1974, Ser. No. 472,237
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—98

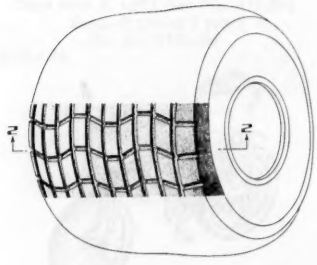


237,478
BICYCLE
D. Lee Carpenter and James E. Cotter, Dayton, Ohio, assignors to The Huffman Manufacturing Company, Miamisburg, Ohio
Filed June 26, 1974, Ser. No. 483,249
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—111

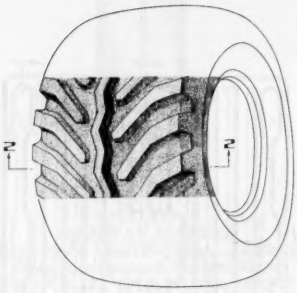
237,479
TIRE
Harold D. Fetty, Birmingham, Mich., and John A. Hutz and Joseph M. Forney, Akron, Ohio, assignors to The Goodyear Tire & Rubber Company
Filed Feb. 7, 1974, Ser. No. 440,607
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—141



237,480
TIRE
Maurice L. Pules, Akron, and Donald J. Eves, Mogadore, Ohio, assignors to The Goodyear Tire & Rubber Company
Filed Jan. 2, 1974, Ser. No. 430,356
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—146

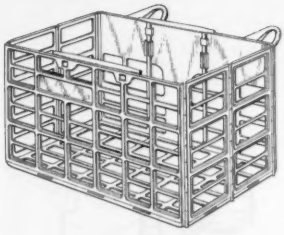


237,481
TIRE
Donald J. Eves, Mogadore, Ohio, assignor to The Goodyear Tire & Rubber Company
Filed Jan. 2, 1974, Ser. No. 430,357
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—147



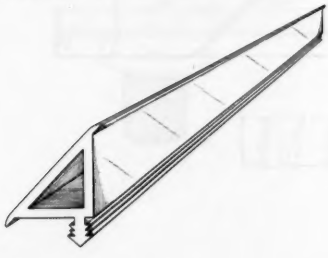
237,482
ANCHOR POST FOR VEHICLE BODY OR FRAME STRAIGHTENING APPARATUS
William J. Meis, 3636 Camerino St., Lakewood, Calif. 90712
Filed Apr. 29, 1974, Ser. No. 465,294
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—155

237,483
BICYCLE BASKET
Mark O. Uitz, 1050 Crestview, Mountain View, Calif. 94040, and William H. Sehestedt, 2841 Mark Ave., Santa Clara, Calif. 95051
Filed Feb. 11, 1974, Ser. No. 441,152
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—158

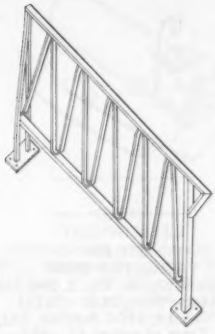


237,484
MOTORCYCLE SADDLE BAG
Harold H. Larsen, Long Beach, and Robert E. Oehring, Norwalk, Calif., assignors to Bates Industries, Inc., Long Beach, Calif.
Filed Mar. 14, 1974, Ser. No. 451,043
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—158

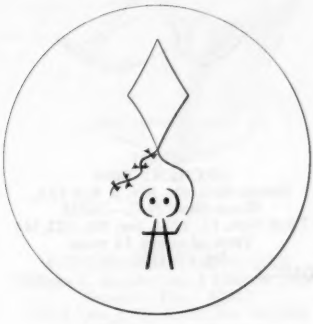
237,485
GLAZING STRIP
Rolf A. Lundberg, 6A Sigyns Vag, S–14900 Nynashamn, Sweden
Filed July 30, 1973, Ser. No. 383,541
Claims priority, application Sweden Jan. 31, 1973
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—6



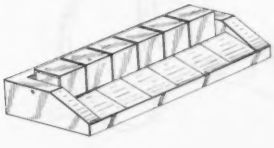
237,486
STAIR RAILING
Paul C. Wutzke, 9312 Mazatlan Way, Elk Grove, Calif. 95624
Filed Apr. 18, 1973, Ser. No. 352,251
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D13—7 R



237,487
LABEL OR SIMILAR ARTICLE
Edward Parker, 307 H St. NW., Washington, D.C. 20001
Filed May 20, 1974, Ser. No. 471,574
Term of patent 14 years
Int. Cl. D19—*08;* D11—*03*
U.S. Cl. D19—16



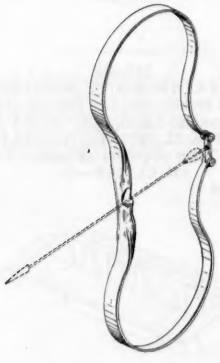
237,488
ROTATABLE BLOCK GAME
Albert Stubbmann, 746 Dakota Trail, Franklin Lakes, N.J. 07417
Filed Feb. 22, 1973, Ser. No. 334,543
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—64



237,489
ARCHERY BOWSTRING RELEASE AID
Marston E. F. Wigley, Cheektowaga, N.Y., assignor to C & S Archery Co., Inc., Cheektowaga, N.Y.
Filed May 30, 1974, Ser. No. 474,309
Term of patent 14 years
Int. Cl. D22—*01*
U.S. Cl. D22—5

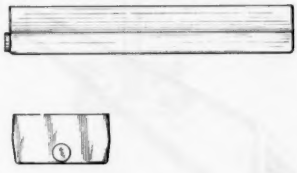
237,490
ARCHERY BOW
Meade McArdle, Rte. 2, Box 73A, Horse Shoe, N.C. 28742
Filed Nov. 11, 1974, Ser. No. 522,343
Term of patent 14 years
Int. Cl. D22—*01*
U.S. Cl. D22—5

237,491
ARCHERY BOW
Meade McArdle, Rte. 2, Box 73A, Horse Shoe, N.C. 28742
Filed Nov. 11, 1974, Ser. No. 522,344
Term of patent 14 years
Int. Cl. D22—*01*
U.S. Cl. D22—5

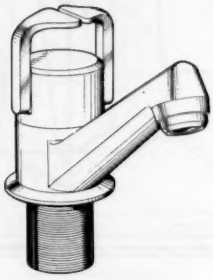


237,492
FISHING LURE
Raymond H. Zimmerman, 1918 First Drive, Marietta, Ga. 30060
Filed May 31, 1974, Ser. No. 475,161
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

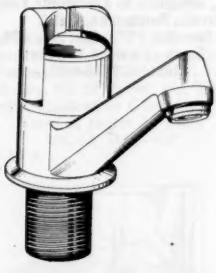
237,493
RAINWATER DOWNSPOUT TROUGH
Virgil A. Sturm, 415 Cedar, Nashua, Iowa 50658
Filed June 14, 1973, Ser. No. 370,166
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—1



237,494
FAUCET
John Harry Gustafsson, Bromolla, Sweden, assignor to Ifo AB, Bromolla, Sweden
Filed July 15, 1974, Ser. No. 488,691
Claims priority, application Sweden Jan. 15, 1974
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—25

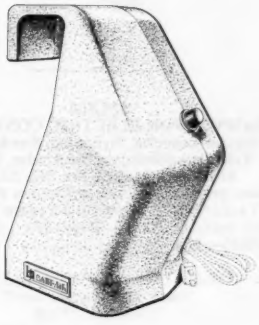


237,495
FAUCET
John Harry Gustafsson, Bromolla, Sweden, assignor to Ifo AB, Bromolla, Sweden
Filed July 15, 1974, Ser. No. 488,692
Claims priority, application Sweden Jan. 15, 1974
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—25



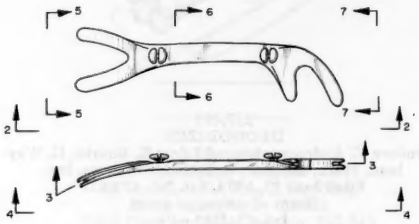
237,496
TIP FOR A MEDICAL ASPIRATOR
Daniel A. Talonn, University City, Mo., assignor to Sherwood Medical Industries Inc., St. Louis, Mo.
Filed June 12, 1974, Ser. No. 478,570
Term of patent 14 years
Int. Cl. D9—*01*; D24—*02*
U.S. Cl. D23—35

237,497
DEODORIZER
Theodore C. Andreopoulos and Edgar R. Bourke, II, Wayland, Mass., assignors to Bath-Air Systems, Inc.
Filed June 17, 1974, Ser. No. 479,819
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—150

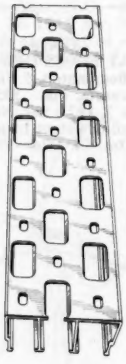


237,498
DENTAL FLOSS DISPENSER
William E. Bennington, 5 Filmore Drive, Sarasota, Fla. 33581
Filed June 7, 1973, Ser. No. 367,953
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—1 D

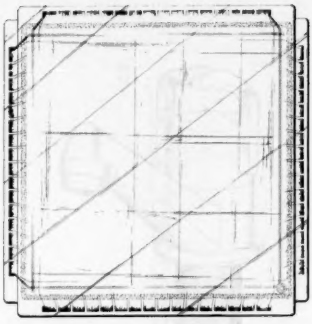
237,499
DENTAL FLOSS HOLDER
Albert L. Maloney and Holly H. Maloney, both of Box 754, Corona Del Mar, Calif. 92625
Filed Jan. 28, 1974, Ser. No. 437,194
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—1 D



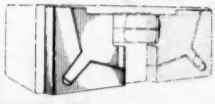
237,500
CHANNEL FOR ELECTRIC CONDUCTORS
Bengt Efraim Legerius, Nykoping, Sweden, assignor to Telefonaktiebolaget, Stockholm, Sweden
Filed Aug. 2, 1973, Ser. No. 384,881
Claims priority, application Sweden Feb. 2, 1973
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 R



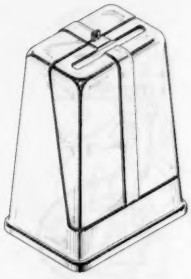
237,501
LIGHT EMITTING GAS DISCHARGE MATRIX DISPLAY PANEL
Fred E. Mansur, Temperance, Mich., assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Sept. 24, 1973, Ser. No. 400,075
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



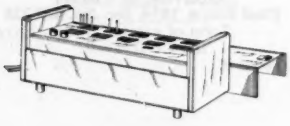
237,502
BIN FOR RECEIVING FAN-FOLD PUNCHED TAPE ON TAPE-USING INSTRUMENTS
George S. Hager, Anaheim, and Joseph B. Dufresne, Apple Valley, Calif., assignors to Electronic Engineering Company of California, Santa Ana, Calif.
Filed June 13, 1974, Ser. No. 479,009
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



237,503
EQUIPMENT COVERING
Holger C. Langmack, Jr., Chancellor Point Road, Trappe, Md. 21673, and James B. Spear, Eveland Road, Ridgley, Md. 21660
Filed Oct. 30, 1973, Ser. No. 410,995
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—5 R

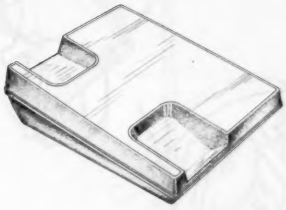


237,504
PROGRAMMED CONTROL UNIT FOR A PLURALITY OF PROJECTORS OR THE LIKE
Peter Hartwein, Schwalbach, Germany, assignor to Braun Aktiengesellschaft, Kronberg, Taunus, Germany
Filed Nov. 5, 1973, Ser. No. 412,650
Claims priority, application Germany May 21, 1973
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 R

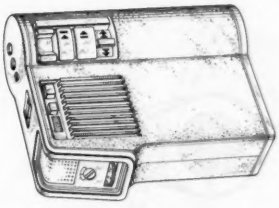


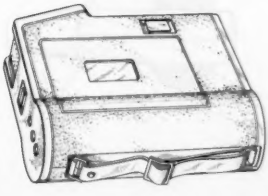
237,505
TELEPHONE OR SIMILAR ARTICLE
Paul-Hans Thies, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany
Filed Aug. 16, 1973, Ser. No. 389,861
Claims priority, application Germany Feb. 20, 1973
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 A

237,506
TELEPHONE STAND
Donald Michael Genaro, Haworth, N.J., John Niel McGarvey, Drexel Hill, Pa., and Gordon Elliot Sylvester, Jamaica, N.Y., assignors to Bell Telephone Laboratories, Murray Hill, N.J.
Continuation-in-part of design application Ser. No. 424,413, Dec. 13, 1973, which is a continuation-in-part of design application Ser. No. 364,704, May 29, 1973, both now abandoned. This application May 14, 1974, Ser. No. 469,855
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 A



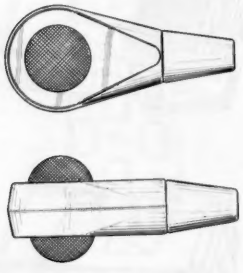
237,507
DICTATION AND PLAYBACK APPARATUS
Arthur J. Pulos, Fayetteville, and Michael Cridland, Manlius, N.Y., assignors to Dictaphone Corporation, Rye, N.Y.
Filed Jan. 6, 1975, Ser. No. 538,567
Term of patent 14 years
Int Cl. D14—*01*
U.S. Cl. D26—14 B



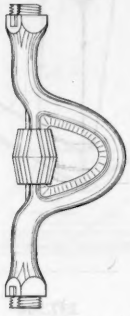


237,508
COMBINED HEADPHONE AND RADIO RECEIVER
Gilbert King-Hung Lung, Kowloon, Hong Kong, assignor to Sonway Manufacturers Limited, Kowloon, Hong Kong
Filed Aug. 3, 1973, Ser. No. 385,575
Claims priority, application Great Britain Feb. 5, 1973
Term of patent 14 years
Int. Cl. D14—*01, 03*
U.S. Cl. D26—14 H

237,509
MICROPHONE
Paul M. D'Amico, Eagan, and Michael P. Carpenter, Minneapolis, Minn., assignors to Telex Communications, Inc., Minneapolis, Minn.
Filed Dec. 10, 1973, Ser. No. 423,472
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 J



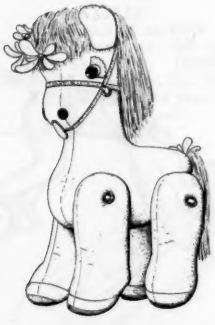
237,510
BRIDLE BIT MOUTHPIECE
Leslie F. Garcia, P.O. Box 1966, Reno, Nev. 89505, and Larry R. Parkison, 6950 Longridge Ave., North Hollywood, Calif. 91605
Filed Apr. 19, 1973, Ser. No. 352,622
Term of patent 14 years
Int. Cl. D30—*04*
U.S. Cl. D30—21



237,511
STUFFED TOY FOX
David J. Carlson, 1504 Inverness Court, Naperville, Ill. 60540
Filed Feb. 4, 1974, Ser. No. 439,228
Term of patent 7 years
Int. Cl. D21—*01*
U.S. Cl. D34—2 R

237,512
STUFFED TOY ANIMAL
Zula B. Cox, Rte. 1, Box 5A, Folsom, La. 70437
Filed May 16, 1974, Ser. No. 470,559
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—2 R

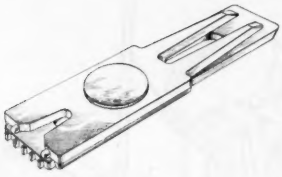
237,513
STUFFED TOY ANIMAL
Zula B. Cox, Rte. 1, Box 5A, Folsom, La. 70437
Filed May 16, 1974, Ser. No. 470,564
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—2 R



237,514
HOCKEY STICK
Jacob Theodore Miller, 147 St. Lucie Drive, Weston, Ontario, Canada, M9M 1T4
Filed Sept. 14, 1973, Ser. No. 397,392
Claims priority, application Canada Aug. 8, 1973
Term of patent 3½ years
Int. Cl. D21—*02*
U.S. Cl. D34—5 BC

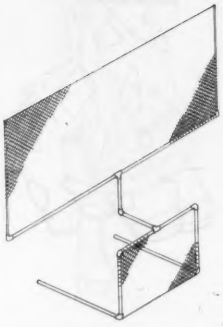
237,515
GOLFER'S EXERCISE DEVICE
Joseph W. Thiel, 2975 S. Hudson St., Denver, Colo. 80222
Filed Nov. 13, 1972, Ser. No. 306,164
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 CB

237,516
MULTIPLE PURPOSE GOLF TOOL
Raymond L. Yaudes, P.O. Box 912, Stephenville, Tex. 76401
Filed Aug. 6, 1973, Ser. No. 386,055
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 CB

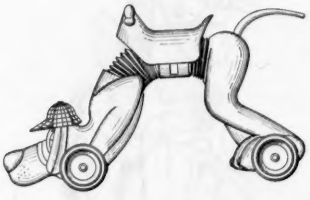


237,517
MINIATURE GOLF GAME BOARD
Ernst Albin Andersson, Toppvagen 18, Tumba, Sweden
Filed Apr. 23, 1974, Ser. No. 463,271
Claims priority, application Sweden Nov. 2, 1973
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 GL

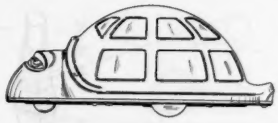
237,518
COMBINED FOOTBALL AND SOCCER BOUNCE-BACK PRACTICE GOAL
Christopher Norgaard, 435 S. High St., Denver, Colo. 80209
Filed May 31, 1974, Ser. No. 474,945
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 VV



237,519
CHILD'S RIDING VEHICLE
George W. Ptaszek, East Ave., Pascoag, R.I. 02859
Filed June 10, 1974, Ser. No. 478,085
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ

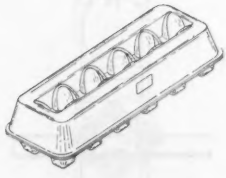


237,520
TURTLE TOY
Michael I. Satten, P.O. Box 93—25 86 Road, Woodhaven, N.Y. 11421
Filed Feb. 4, 1974, Ser. No. 439,921
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 B

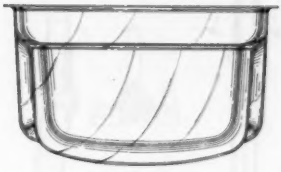


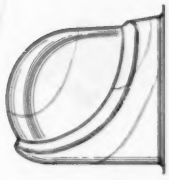
237,521
SPINNING TOP
Daniel R. Tremblay, 8521 D'Artagnan, St. Leonard, Montreal 457, Quebec, Canada
Filed Feb. 26, 1973, Ser. No. 335,568
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 BB

237,522
TOY EGG CARTON
George Castanis, 444 6th Ave., New York, N.Y. 10009
Filed Feb. 7, 1973, Ser. No. 330,439
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 R



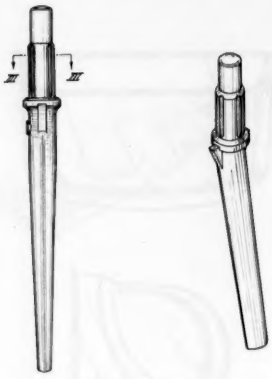
237,523
WINDOW GREENHOUSE
Gerald A. Johnson, Dekalb, Ill., and Robert R. Boehland, Jr., Zenda, Wis., assignors to Feather Hill Industries, Incorporated, Zenda, Wis.
Filed Nov. 5, 1973, Ser. No. 412,550
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D35—3 R



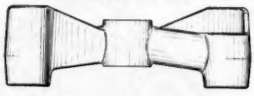


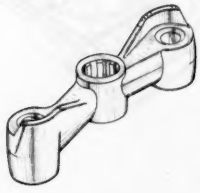
237,524
MOTOR SHROUD FOR A ROTARY LAWNMOWER
Larry Monroe Cognata, Nashville, Tenn., assignor to The Murray Ohio Manufacturing Company, Brentwood, Tenn.
Filed Sept. 17, 1974, Ser. No. 507,139
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D40—1 B

237,525
CULTIVATOR TINE
Cornelis van der Lely, 7 Bruschenrain, Zug, Switzerland, and Ary van der Lely, 10 Weverskade, Maasland, Netherlands
Filed Aug. 5, 1974, Ser. No. 494,964
Claims priority, application Switzerland Feb. 18, 1974
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D40—1 E

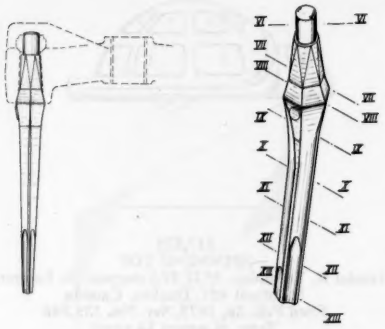


237,526
CULTIVATOR TINE SUPPORT
Ary van der Lely, 10 Weverskade, Maasland, Netherlands
Filed Oct. 4, 1974, Ser. No. 512,047
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D40—1 E

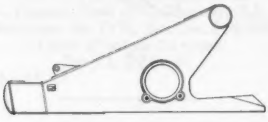


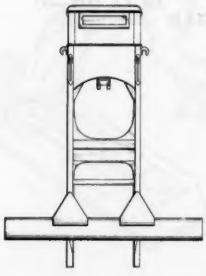


237,527
CULTIVATOR TINE
Ary van der Lely, 10 Weverskade, Maasland, Netherlands
Filed Oct. 4, 1974, Ser. No. 512,049
Claims priority, application Switzerland Apr. 11, 1974
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D40—1 E

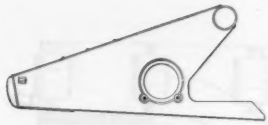


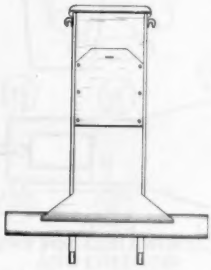
237,528
EARTHMOVING SCRAPER PUSH FRAME
George A. Fisher and Bennett N. Waddell, Joliet, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Mar. 27, 1974, Ser. No. 455,492
Term of patent 14 years
Int. Cl. D15—*04*
U.S. Cl. D40—5





237,529
EARTHMOVING SCRAPER PUSH FRAME
George A. Fisher and Bennett N. Waddell, Joliet, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Mar. 27, 1974, Ser. No. 455,493
Term of patent 14 years
Int. Cl. D15—*04*
U.S. Cl. D40—5



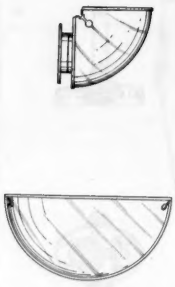


237,530
RING OR SIMILAR ARTICLE
Eugene A. Poulin, 85 Royal Oak Road, New Britain, Conn. 06053
Continuation-in-part of abandoned design application Ser. No. 344,470, Mar. 26, 1973. This application June 24, 1974, Ser. No. 482,085
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—10 B

237,531
RING OR SIMILAR ARTICLE
Eugene A. Poulin, 85 Royal Oak Road, New Britain, Conn. 06053
Continuation-in-part of abandoned design application Ser. No. 344,474, Mar. 26, 1973. This application June 24, 1974, Ser. No. 482,087
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—10 B

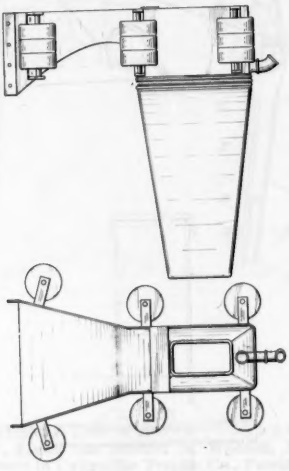
237,532
RING OR SIMILAR ARTICLE
Eugene A. Poulin, 85 Royal Oak Road, New Britain, Conn. 06053
Continuation-in-part of abandoned design application Ser. No. 344,473, Mar. 26, 1973. This application June 24, 1974, Ser. No. 482,088
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—10 B

237,533
LAMP FIXTURE
Sergio Gandini, Via Tosio 20, Brescia, Italy
Filed Mar. 12, 1974, Ser. No. 450,337
Claims priority, application Italy Feb. 7, 1974
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—4 B



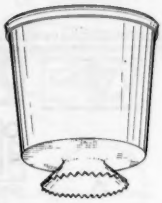
237,534
TABLE LANTERN
Ralph T. Jacobsen, Stoughton, Wis., assignor to ESB Incorporated, Philadelphia, Pa.
Filed Feb. 4, 1974, Ser. No. 439,074
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 R

237,535
FLOATING POLLUTANT SKIMMER
Douglas J. Graham, 19 Imperial Ave., San Francisco, Calif. 94123
Filed May 6, 1974, Ser. No. 467,063
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D49—11



237,536
DISPENSING CONTAINER FOR PAPER TOWELS OR THE LIKE
Bengt Georg Hagglund, Floda, and Bengt Sigvard Goransson, Kungsor, Sweden, assignors to Bengt Georg Hagglund, Floda, Sweden
Filed Aug. 31, 1972, Ser. No. 285,431
Claims priority, application Sweden Mar. 1, 1972
Term of patent 7 years
Int. Cl. D6—*99*
U.S. Cl. D52—2 C

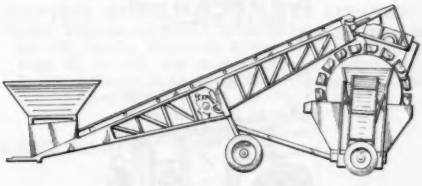
237,537
DISPENSING CONTAINER FOR PAPER TOWELS OR THE LIKE
Bengt Georg Hagglund, Floda, and Bengt Sigvard Goransson, Kungsor, Sweden, assignors to Bengt Georg Hagglund, Floda, Sweden
Filed Sept. 22, 1972, Ser. No. 291,837
Claims priority, application Sweden Mar. 28, 1972
Term of patent 7 years
Int. Cl. D6—*99*
U.S. Cl. D52—2 C



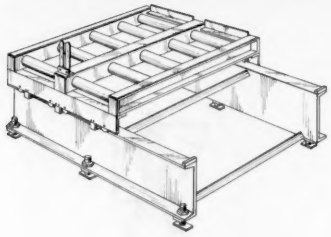
237,538
COMPONENT FOR GRILLWORK, RAILINGS AND COLUMNS
Ellis Deloy Larson, 225 E. State Road, Pleasant Grove, Utah 84062
Filed May 16, 1974, Ser. No. 470,357
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D54—2 B

237,539
COMPONENT FOR GRILLWORK, RAILINGS AND COLUMNS
Ellis Deloy Larson, 225 E. State Road, Pleasant Grove, Utah 84062
Filed May 16, 1974, Ser. No. 470,359
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D54—2 B

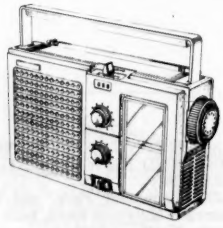
237,540
COMBINED SCREENING, CONVEYING, WASHING, SEPARATING AND DE-WATERING APPARATUS FOR QUARRYING
Patrick O'Neill, Glenmount Park, and Patrick Joseph Douglas, Annvale, Killyman Road, both of Dungannon, County Tyrone, Northern Ireland
Filed Feb. 19, 1974, Ser. No. 443,611
Claims priority, application Great Britain Aug. 18, 1973
Term of patent 14 years
Int. Cl. D12—*05*; D15—*99*
U.S. Cl. D55—1 C



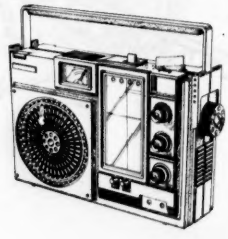
237,541
BATTERY CHANGER FOR ELECTRIC FORK TRUCKS
Paul J. Doelling, 10105 Cambridge, Kansas City, Mo. 64134
Filed June 24, 1974, Ser. No. 482,485
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D55—1 C



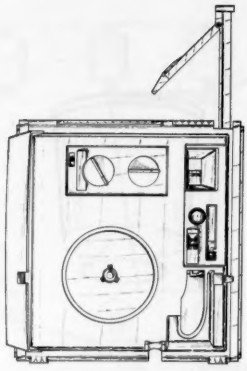
237,542
RADIO RECEIVER
Kazumasa Takenaka, Moriguchi, Osaka, and Hironosuke Koda, Kyoto, Japan, assignors to Matsushita Electric Industrial Company, Ltd., Kadoma, Osaka, Japan
Filed Apr. 17, 1974, Ser. No. 461,762
Claims priority, application Japan Oct. 22, 1973
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B



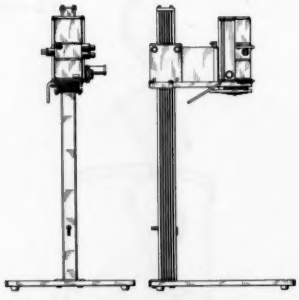
237,543
RADIO RECEIVER
Masamichi Yamamura and Hironosuke Koda, Kyoto, Japan, assignors to Matsushita Electric Industrial Company, Ltd., Kadoma, Osaka, Japan
Filed Apr. 17, 1974, Ser. No. 461,766
Claims priority, application Japan Oct. 22, 1973
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B



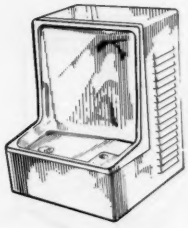
237,544
MOTION PICTURE PROJECTOR OR THE LIKE
Dianne B. Ainslie, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed June 20, 1974, Ser. No. 481,288
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D61—1 K



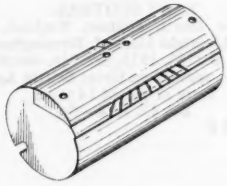
237,545
PHOTOGRAPHIC ENLARGER OR SIMILAR ARTICLE
Haruki Yamaguchi, Toyokawa, and Masakazu Nakanishi, Hashimoto, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Jan. 17, 1974, Ser. No. 434,310
Claims priority, application Japan July 18, 1973
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D61—1 Q

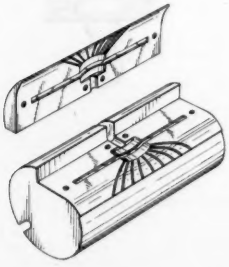


237,546
WALL FOUNTAIN
Patrick T. Kelly, Los Angeles, Calif., assignor to Haws Drinking Faucet Company, Berkeley, Calif.
Filed May 10, 1973, Ser. No. 358,968
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D67—4

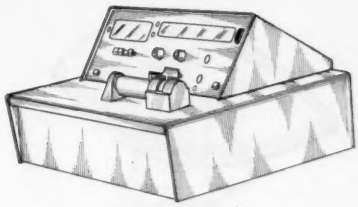


237,547
DIALYSER CORE
Romano Flandoli, Mirandola, Italy, assignor to Sandoz Ltd., Basel, Switzerland
Filed June 7, 1973, Ser. No. 367,970
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—1 F

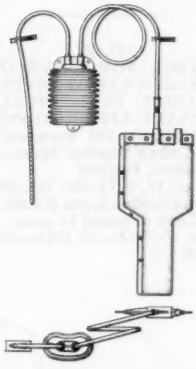




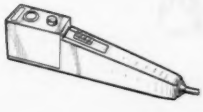
237,548
BLOOD GAS ANALYZER AND THE LIKE
Dean T. Farrish, Parker, Colo., assignor to Sandoz, Inc., East Hanover, N.J.
Filed Jan. 10, 1974, Ser. No. 432,143
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D83—1 F



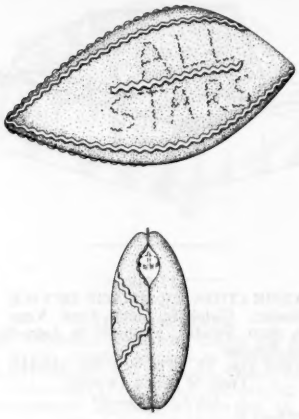
237,549
ASPIRATION DRAINAGE DEVICE
Hans Tillander, Goteborg, and Fred Vage Gunnar Ekbladh, Saro, Sweden, assignors to Astra-Sjuco AB, Goteborg, Sweden
Filed Mar. 29, 1974, Ser. No. 456,369
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D83—1 F



237,550
CONTROL PANEL FOR AN X-RAY APPARATUS
Vitislav Yakovlevich Bobov, Bolsheokhtinsky prospekt 12, kv. 42; Dmitry Petrovich Rybakov, ulitsa Dzerzhinskogo 69, kv. 22; and Avrum Lvovich Farberg, ulitsa Bolshaya Ozernaya 86, kv. 1, all of Leningrad, U.S.S.R.
Filed June 15, 1973, Ser. No 370,473
Term of patent 14 years
Int. Cl. D24—*02;* D13—*03*
U.S. Cl. D83—1 H

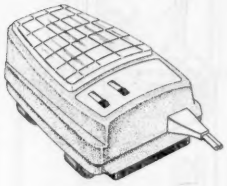


237,551
REFILLABLE FLUID CONTAINER USED TO APPLY HEAT OR COLD FOR THERAPEUTIC PURPOSES
Edith Amend, 10 Maher Ave., Greenwich, Conn. 06830
Filed Sept. 17, 1973, Ser. No. 397,794
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D83—1 P



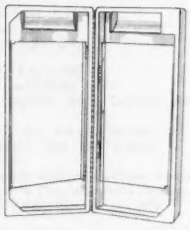
237,552
TUBING ADAPTOR FOR INTERCOUPLING BETWEEN PASSAGEWAYS OF DIFFERENT DIAMETER PRIMARILY IN MEDICAL, SURGICAL AND VETERINARY APPLICATIONS
James Bernard Willmott, 195 Burmarsh Road, Hythe, England, and Andrew Gordon Hanton, 63 Grasmere Gardens, Folkestone, England
Filed Sept. 17, 1973, Ser. No. 398,057
Claims priority, application Great Britain Mar. 16, 1973
Term of patent 14 years
Int. Cl. D24—*99*; D23—*01*
U.S. Cl. D83—1 R

237,553
MASSAGER
Roy E. Meyer, Sterling, and Joe R. Mango, Chicago, Ill. assignors to Wahl Clipper Corporation, Sterling, Ill.
Filed Mar. 11, 1974, Ser. No. 450,056
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D83—1 T



237,554
BABY SOOTHER
Robert Solomon Hurst, Solihull, England, assignor to Lewis Woolf Griptight Limited, Birmingham, England
Filed Oct. 12, 1973, Ser. No. 406,099
Claims priority, application Great Britain Apr. 24, 1973
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D83—8 C

237,555
CARRYING CASE FOR A SET OF TOOLS
Everett R. Yonce, 464 42nd St., Oakland, Calif. 94606
Filed Dec. 4, 1972, Ser. No. 311,751
Term of patent 14 years
The term of this patent subsequent to Nov. 20, 1990, has been disclaimed
Int. Cl. D3—*02*
U.S. Cl. D87—1 R



237,556
BEVERAGE DISPENSER OR SIMILAR ARTICLE
Roger L. Schlaifer, 1 Valley Forge Place, Atlanta, Ga. 30318
Filed Jan. 24, 1974, Ser. No. 436,138
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D94—3 C

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 4TH DAY OF NOVEMBER, 1975

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Attenburrow, David J., to Reed International Limited. Supporting collar. 3,916,884, Cl. 128-75.000.

Attridge, William Earl; and Vogel, Karl Franz. Apparatus for edge-shaping boards. 3,916,965, Cl. 144-134.00R.

Audi NSU Auto Union Aktiengesellschaft: *See—*
Heide, Horst, 3,916,623.
Kromer, Gunter, 3,916,846.

Audry, Claudette: *See—*
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Auerbach, Melvin; and Pierson, Robert M., to Goodyear Tire & Rubber Company, The. Method of building a radial tire. 3,916,969, Cl. 152-354.000.

Auerbach, Melvin, to Goodyear Tire & Rubber Company, The. Nitrone compounds. 3,917,700, Cl. 260-566.00R.

Aumuller, Walter: *See—*
Weber, Helmut; Aumuller, Walter; Weyer, Rudi; Muth, Karl; and Schmidt, Felix Helmut, 3,917,690.

Auston, David Henry, to Bell Telephone Laboratories, Incorporated. Picosecond semiconductor electronic switch controlled by optical means. 3,917,943, Cl. 250-211.00J.

Automation Products, Inc.: *See—*
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Automobiles Peugeot: *See—*
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Avco Corporation: *See—*
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Avibank Mfg. Inc.: *See—*
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Avondale Shipyards, Inc.: *See—*
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Ayerst McKenna And Harrison Ltd.: *See—*
Immer, Hans U.; Sestanj, Kazimir; Nelson, Verner R.; and Gotz, Manfred K., 3,917,581.

Ayerst McKenna and Harrison Ltd.: *See—*
Immer, Hans U.; Sestanj, Kazimir; Nelson, Verner R.; and Gotz, Manfred K., 3,917,578.

Ayme, Gerard. Device for heaving in, letting out and storing a chain. 3,917,229, Cl. 254-175.500.

Ayres, James L.; Peterson, Jeffery D.; and Steele, Robert C., to Gold Kist Inc. Cooked textured poultry product and method for preparing same. 3,917,860, Cl. 426-644.000.

B.F. Goodrich Company, The: *See—*
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McGinnis, Hebert E., 3,917,092.

Baba, Anthony J.: *See—*
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Babcock & Wilcox Company, The: *See—*
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Babcock & Wilcox, Limited: *See—*
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Bach, Bernhard: *See—*
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Backman, Anders Lars Erik; and Forsberg, Stig Gunnar, to Sandvik Aktiebolag. Method of making stainless steel. 3,917,492, Cl. 148-12.00E.

Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
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Trieschmann, Hans-Georg; Pfannmueller, Helmut; Urban, Friedrich; Buechner, Oskar; Steigerwald, Klaus; and Ball, Wolfgang, 3,917,577.

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Bagli, Jehan F.: *See—*
Abraham, Nedumparambil A.; Bagli, Jehan F.; and Bogri, Tibor, 3,917,668.

Bagnulo, Luigi. Method of establishing a pipe joint. 3,916,502, Cl. 29-451.000.

Bailey, Clifford Michael: *See—*
Morser, Alfred Harold; Gibson, Roy; Scott, Stephen Anthony; Bailey, Clifford Michael; and Taylor, Ian Keith, 3,918,045.

Bailey, David S., to Eastman Kodak Company. Photographic compositions, elements and processes for the production of formazan dye images of enhanced red absorption. 3,917,484, Cl. 96-48.00R.

Bailey, John T.: *See—*
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Baird, William C., Jr.; Hartgerink, Ronald L.; and Surridge, John H., to Exxon Research & Engineering Company. Carbonylation of organomercurials. 3,917,670, Cl. 260-471.00R.

Bak, Bela; Engard, Ferenc; and Szoke, Josef, to MTA Kozponti Fizikai Kutato Intezet. Equipment for the automatic determination of the chemical composition of liquid by sampling and by adding of reagents. 3,917,455, Cl. 23-253.00R.

Baker, Don R., to Stauffer Chemical Company. A method for killing insects and mites. 3,917,827, Cl. 424-210.000.

Baker Drapery Corporation: *See—*
Baker, George H., Sr., 3,916,477.

Baker, George H., Sr., to Baker Drapery Corporation. Drapery supporting bracket. 3,916,477, Cl. 16-94.00D.

Baker, Kenneth D., to Engelhard Minerals & Chemicals Corporation. Electroless gold plating process. 3,917,885, Cl. 427-304.000.

Baker, Robert E.: *See—*
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Baker, Thomas C.: *See—*
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Bakker, Rudolf G.; and Klumpes, Hans, to De Rotterdamsche Droogok Maatschappij B.V. Method and an apparatus for building up sheet material from welding metal. 3,916,977, Cl. 164-52.000.

Bald, Robert E.: *See—*
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Baldwin, Roger Allen; Hawthorne, Marion Frederick; and Cheng, Ming Tzu, to Kerr-McGee Chemical Corporation. Process for the preparation of 4-nitro-m-cresol. 3,917,719, Cl. 260-622.00R.

Ball Corporation: *See—*
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Ball, Wolfgang: *See—*
Trieschmann, Hans-Georg; Pfannmueller, Helmut; Urban, Friedrich; Buechner, Oskar; Steigerwald, Klaus; and Ball, Wolfgang, 3,917,577.

Ballard, Alexander K. S. Portable douche and sitz bath. 3,916,896, Cl. 128-239.000.

Ballard, Nathan Thomas, to Ampex Corporation. Forming interconnections between circuit layers. 3,916,513, Cl. 29-625.000.

Bandukwalla, Phiroze, to General Motors Corporation. Diffuser. 3,917,434, Cl. 415-181.000.

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Barber, Howard J. Golf game apparatus. 3,917,279, Cl. 273-176.00A.

Bardoni, Thomas J.; Markarian, William; and Richardson, Kenneth O. Underwater propulsion devices. 3,916,814, Cl. 115-6.100.

Bargetzi, Rene Maurice, to Reno S.A. Watch-repairing set-up. 3,917,106, Cl. 220-23.830.

Barks, Ronald E., to Norton Company. Sintered abrasive containing oxides from the system ceria, alumina, zirconia. 3,916,585, Cl. 51-309.000.

Barmag Barmer Maschinenfabrik Aktiengesellschaft: *See—*
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Barnes, Clive: *See—*
Jordan, Joseph Thomas; Ward, John Joseph Bernard; and Barnes, Clive, 3,917,517.

Barnes, James H. Meat cutter slicer and extruder. 3,917,178, Cl. 241-82.500.

Baron, Frank A.: *See—*
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Barr, Katie H.; and Niccolls, Wesley O. Low and high pitch steam whistle. 3,916,818, Cl. 116-70.000.

Barrett, James M., to City of San Diego. Air classifier for shredded refuse. 3,917,567, Cl. 209-138.000.

Barrett, Paul Anthony, to Burroughs Wellcome Co. Method and composition for management of anaplasmosis. 3,917,848, Cl. 424-323.000.

Barron, Charles D., to Byron Jackson Inc. Well drilling control system. 3,917,230, Cl. 254-173.00R.

Barry, John D. A. Protecting. 3,916,658, Cl. 70-417.000.

Bartelink, Everhard H. B., to Northeast Electronics Corporation. Methods and apparatus for 4-wire switching. 3,917,907, Cl. 179-18.0AF.

Bartels, Bernd, to Aktiengesellschaft "Weser". Offshore marine station. 3,916,812, Cl. 114-230.000.

Barth, Wayne E., to Pfizer Inc. A method of preventing asthmatic symptoms. 3,917,835, Cl. 424-251.000.

Barton, Derek Harold Richard; and Hesse, Robert Henry, to Research Institute for Medicine And Chemistry Inc. Process for the preparation of N-monofluoro-acid amides, N-monofluoro and N,N-difluorotertiary amines. 3,917,688, Cl. 260-543.00F.

Barton, Margaret M.: *See—*
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Barton, Richard E.; and Barton, Margaret M. Fuel-flow limiting apparatus. 3,916,854, Cl. 123-108.000.

Barton, Robert M., to J. I. Case Company. Hydraulic control circuit for vehicles. 3,916,767, Cl. 91-412.000.

Barton, Sterling C.: *See—*
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BASF Aktiengellschaft: *See—*
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Basile, Mario J. Sealant filler for small volumes containing an acrylic latex, sand, bentonite, portland cement and a polyhydric alcohol. 3,917,771, Cl. 264-35.000.

Bass, Joseph A.; McKenzie, Lewis A.; and Powers, Frank M., to Southwire Company. Apparatus for fluxing and filtering of molten metal. 3,917,242, Cl. 266-34.00R.

Bass, Robert J.; Koch, Richard C.; Richards, Hugh C.; and Thorpe, John E., to Pfizer Inc. Control of plant diseases employing certain pyrrols compounds. 3,917,838, Cl. 424-258.000.

Bass, Samuel L., Jr.; and Schellstede, Herman J., to Bass, Samuel L., Jr. Drilling stabilizer and method. 3,916,998, Cl. 166-301.000.

Baudet, Marcel, to Societe a Responsabilite Limitee EPEX. Stackable packing trays. 3,917,156, Cl. 229-32.000.

Bauer, Peter: *See—*
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Baurecht, Heinz-Ewald; Preuss, Manfred; Wolf, Karlheinz; and Hornle, Reinhold, to Bayer Aktiengesellschaft. Pigment pastes. 3,917,556, Cl. 260-33.20R.

Baxter Laboratories, Inc.: *See—*
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BBC Brown Boveri & Company Limited: *See—*
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BDH Pharmaceuticals Limited: *See—*
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Beach, William H. Feeding device. 3,917,126, Cl. 222-195.000.

Beam, Daniel J.; and Butler, James J., Jr., to Jones & Laughlin Steel Corporation. Coating control. 3,917,888, Cl. 427-433.000.

Beatrice Foods Company: *See—*
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Beavers, Allan E., to T. A. Pelsue Company. Heater-blower assembly. 3,916,870, Cl. 126-110.00B.

Bechtel International Corporation: *See—*
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Beck, Francis J., to Honeywell Inc. Power supply monitor. 3,918,043, Cl. 340-248.00B.

Beck, James H.; and Beck, Robert C. Golf putter with direction indicator. 3,917,277, Cl. 273-163.00R.

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Becker, Joseph T. Miniature aircraft and launcher unit therefor. 3,916,560, Cl. 46-80.000.

Becker, Otto Alfred. Insulating flexible composite element and purge system. 3,917,471, Cl. 55-267.000.

Becker, Robert L., to Dealers Truck Equipment Inc. Combined post and tie-down anchor. 3,917,338, Cl. 296-28.00M.

Beckman, Paul, to United States Surgical Corporation. Temperature and pulse detector. 3,916,877, Cl. 128-2.05R.

Behar, Marcel N.; and Morscheck, Timothy J., to Eaton Corporation. Inter-axle differential lock. 3,916,728, Cl. 74-711.000.

Behne, Ernst-August: *See—*
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Behrenz, Wolfgang: *See—*
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Bell Telephone Laboratories, Incorporated: *See—*
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Bender, Rainer: *See—*
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Benjamin, Thomas A., to Medical Environment Devices, Inc. Control valve for medicinal fluids. 3,916,948, Cl. 137-608.000.

Benn, Manfred: *See—*
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Bennett, David F. Float operated valve. 3,916,945, Cl. 137-445.000.

Bennett, Robert R., to Westinghouse Electric Corporation. Buffer zone for counterflow preheater. 3,916,843, Cl. 122-32.000.

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Bentkowski, Zdzislaw: *See—*
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Bereisa, Jonas, Jr., to Aerojet-General Corporation. Dual mode control of an induction electric motor. 3,917,989, Cl. 318-231.000.

Berenstain, Arthur Z., to Larson Laboratories, Inc. Aerosol can and actuating cap. 3,917,127, Cl. 222-402.130.

Beretta, Oscar. Containers made in metallic wires. 3,917,103, Cl. 220-6.000.

Berg, Coleman David: *See—*
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Berger, William L., to Morris Coupling & Clamp Company. Coupling. 3,916,489, Cl. 24-279.000.

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Bergeron, Charles R., to Ethyl Corporation. Process for preparing trisodium nitrilotriacetate. 3,917,685, Cl. 260-534.00E.

Bergeron, Gregory B. Bicycle locking and securing devices. 3,917,138, Cl. 224-42.03B.

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Bernin, Victor M.; and Engstrom, Keith A., to Illinois Tool Works Inc. N-key rollover keyboard. 3,918,051, Cl. 340-365.00E.

Bernstein, Jack: *See—*
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Bertetto, Donald W.: *See—*
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Berthet, Aristide; and Blum, Jacques, to Institut De Recherches De La Siderurgie Francaise (IRSID). Apparatus and method for regulating molten metal supply. 3,917,111, Cl. 222-1.000.

Bertrand, Claude: *See—*
Gradeff, Peter S.; and Bertrand, Claude, 3,917,713.

Berz, Wolfgang. Apparatus for purifying a raw gas or suspended solid particles. 3,917,472, Cl. 55-282.000.

Beschke, Helmut; Kleemann, Axel; and Schreyer, Gerd, to Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler. Catalyst for the production of pyridine and 3-methylpyridine. 3,917,542, Cl. 252-442.000.

Best, Donald F.: *See—*
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Betts, Max Williams; and Robinson, Frank, to Courtaulds Limited. Knitting machine cam system with pressing off means. 3,916,648, Cl. 66-75.000.

Betz Laboratories, Inc.: *See—*
Shema, Bernard F.; Brink, Robert H., Jr.; and Swered, Paul, 3,917,834.

Betzler, Otto, to Michael Weinig KG. Device for centering a rotary tool body on a drive shaft. 3,917,422, Cl. 403-15.000.

Beuter, Rudolf; Reissmann, Walter; and Cesal, Rudolf, to GRUNDIG E.M.V. Elektro-Mechanische Versuchsanstalt Max Grundig. Circuit for the raster writing conversion of data to be reproduced on a video screen. 3,918,040, Cl. 340-324.0AD.

Biebuyck, Lawrence F., to Kawneer Company, Inc. Method for glass framing. 3,916,595, Cl. 52-747.000.

Biernot, Oskar Karl. Sheet cutting. 3,916,742, Cl. 83-27.000.

Billet, Lucien; and Lartigau, Guy, to Rhone-Poulenc S.A. Preparation of dicarboxylic acids. 3,917,687, Cl. 260-537.00P.

Bing, Herbert A., to Polaroid Corporation. Unique prismatic element and projection system. 3,917,392, Cl. 353-81.000.

Bio-Medicus, Inc.: *See—*
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Birdsboro Corporation: *See—*
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Birkner, Franz X., to Subsea Products, Inc. Strobe light. 3,917,975, Cl. 315-200.00R.

Bischoff, Edelbert; and Hessler, Willi, to Werner & Mertz GmbH. Self polishing cleaning floor wax. 3,917,552, Cl. 260-28.50R.

Bitterli, Peter; and Kehrer, Fritz, to Sandoz Ltd. Iminoisoindolinones. 3,917,641, Cl. 260-325.000.

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Blackburn, Alfred T.; and Uhtenwoldt, Herbert R., to Cincinnati Milacron-Heald Corporation. Grinding machine. 3,916,576, Cl. 51-165.740.

Blackie, James W. F.; Maleski, Gregory J.; Newell, Chester W.; and Vogel, Charles A., to American Videonetics Corporation. Tape element, system and method for reversal of tape movement during low sound levels. 3,918,086, Cl. 360-55.000.

Blake, Nathan L.: *See—*
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Blakewood, Eldred G., III. Multiple chess or checker game board. 3,917,273, Cl. 273-131.0KN.

Blanchet, Hilaire. Rotor assembly for snow blower. 3,916,542, Cl. 37-43.00R.

Bland, John: *See—*
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Blank, Werner Josef: *See—*
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Block, Bruce E.; and Samuelson, Philip H., to Rockford Automation, Inc. Power driven conveyor. 3,916,797, Cl. 104-172.00B.

Bloom, Joseph Louis; and Smith, Trevor Stanley, to Lucas Aerospace Limited. Fluid pressure operated actuator arrangement. 3,917,430, Cl. 415-26.000.

Blower, Warren A.; and Nara, Harry R., to Sherwin-Williams Company, The. Sound attenuating improvements for foundry molding machines. 3,916,982, Cl. 164-206.000.

Blower, Warren A., to Sherwin-Williams Company, The. Vibrator. 3,917,233, Cl. 259-1.00R.

Blum, Harold A.: *See—*
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Blum, Jacques: *See—*
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Blum, Julius A. Method of forming a winch assembly upon a power-driven vehicle, and such assembly. 3,917,228, Cl. 254-166.000.

BMR Security Products Corporation: *See—*
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Bobeau, Daniel: *See—*
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Boberg, Jarl A., to A. B. Machine Company. Lead weight-making apparatus. 3,916,986, Cl. 164-332.000.

Boehringer Ingelheim GmbH: *See—*
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Boehringer, Wilfred E.; and Walker, James V., to McDonnell Douglas Corporation. Multi-stage valve. 3,916,933, Cl. 137-102.000.

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Boesch, Roger, to Rhone-Poulenc, S.A. Insecticidal and acaricidal phenylhydrazone derivatives. 3,917,849, Cl. 424-327.000.

Boge, Raymond J., to Gundersen Clinic, Ltd. External x-ray beam flattening filter. 3,917,954, Cl. 250-510.000.

Boger, Manfred: *See—*
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Boggs, Luther Miles; Flichman, Howard John; Hudson, James Alphus, Jr.; and Levengood, Johnny William, to Western Electric Company, Incorporated. Method of and apparatus for measuring automatically successive sections of an elongated material. 3,916,676, Cl. 73-67.80S.

Bogri, Tibor: *See—*
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Bok, Lowell D., to B.F. Goodrich Company, The. Friction disc member for brake or clutch. 3,917,043, Cl. 192-107.00R.

Bollman, Robert L.: *See—*
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Bolton, Anthony P.; Best, Donald F.; and Shaw, Herbert C., to Union Carbide Corporation. Method for preparing zeolite-based catalyst composition. 3,917,543, Cl. 252-455.00Z.

Bonanno, Anthony J.: *See—*
Greenfield, Charles; Casparian, Robert E.; and Bonanno, Anthony J., 3,917,508.

Bonecutter, Charles A.: *See—*
Murib, Jawad H.; Schott, Stuart; and Bonecutter, Charles A., 3,917,809.

Booth, Thomas Allan, to Addressograph-Multigraph Corporation. Bifurcated phototypesetter and headline machine. 3,918,067, Cl. 354-5.000.

Booth, William M.; and Rieth, James E., to Rieth, James E. Trolling apparatus. 3,916,555, Cl. 43-27.400.

Booton, Alan John, to R. G. Dixon & Company Limited. Waste compactors. 3,916,782, Cl. 100-229.00A.

Borchers, Herbert H.: *See—*
Johnson, J. Walter; and Borchers, Herbert H., 3,917,906.

Borden, Inc.: *See—*
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Borg-Warner Corporation: *See—*
Allaben, Charles M., Jr., 3,917,425.
Kelbel, Donald W.; and Holdeman, John W., 3,916,712.
Kelbel, Donald W.; and Holdeman, John W., 3,916,718.
Volk, Joseph A., Jr., 3,917,979.

Borgnat, Daniel; Forestier, Guy; and Rupp, Georges, to Institut de Recherches de la Siderurgie Francaise. Supersonic shock wave tuyere. 3,917,243, Cl. 266-41.000.

Bos, Jaap Willem, to D.E.J. International Research Company N.V. Agglomeration of instant powders. 3,917,858, Cl. 426-594.000.

Boske, Johann. Method to counteract a clogging of drain pipes. 3,917,530, Cl. 210-58.000.

Bosniack, David S., to Exxon Research & Engineering Co. Fluorinated polyolefin laminates bonded with an asphalt-atactic polypropylene mixture. 3,917,895, Cl. 428-421.000.

Bossert, Friedrich: *See—*
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 3,917,619.
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 3,917,620.
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 3,917,622.

Botes, Hendrik Jacobus Weideman, to Agricura Laboratoria Limited. Treatment of mastitis in cows, the product for this treatment and to the production of said product. 3,917,818, Cl. 424-87.000.

Bottas, Michael J.; and Brooks, Robert W., to Whirlpool Corporation. Refuse compactor structure. 3,917,107, Cl. 220-65.000.

Bouboulis, Constantine J., to Exxon Research & Engineering Co. Preparation of phenylene diacetonitrile. 3,917,665, Cl. 260-465.00H.

Boucher, Raymond Marcel Gut, to Wave Energy Systems Inc. Biocidal synergistic compositions for surface and space disinfection. 3,917,850, Cl. 424-333.000.

Bouillon, Claude: *See—*
Kalopissis, Gregoire; and Bouillon, Claude, 3,917,815.

Bouniot, Albert; and Dufour, Henri, to Rhone-Poulenc Industries. Process for producing methacrolein. 3,917,712, Cl. 260-601.00R.

Bouy, Pierre; and Cheradame, Guy, to Rhone-Progil. Electrode for electrochemical reactions. 3,917,525, Cl. 204-290.00F.

Bowden Controls Limited: *See—*
Hawtree, George; and Hoyle, Edgar, 3,916,723.

Boyadjieff, George I.; and Otsap, Ben A., to Varco International, Inc. Remotely operated well safety valves. 3,916,992, Cl. 166-224.00A.

Brachert, Heinrich: *See—*
Eich, Johannes; and Brachert, Heinrich, 3,917,767.

Bramucci, Guy. Shield for cigarettes and cigars. 3,916,916, Cl. 131-175.000.

Brandli, Gerold, to BBC Brown Boveri & Company Limited. Apparatus for measuring surface temperatures by infrared radiation therefrom. 3,916,690, Cl. 73-355.0EM.

Branecky, George N., to Pitney-Bowes, Inc. Method of weighing pieces of mail. 3,916,695, Cl. 73-432.00R.

Branick, Charles Earl, to Applied Power Inc. Strip laying apparatus. 3,917,250, Cl. 270-30.000.

Branson Ultrasonics Corporation: *See—*
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Brant, Douglas M.: *See—*
Holmes, Paul M.; Brant, Douglas M.; Swope, Thomas J.; and Reinker, Joseph F., Jr., 3,916,947.

Branton, Donald L., to Sta-Rite Industries, Inc. Automatic washing and sanitizing apparatus for a pipeline milking system. 3,916,923, Cl. 134-57.00R.

Brauns, Robert Gary: *See—*
Villaume, Henry F.; Collins, Stephen D.; and Brauns, Robert Gary, 3,916,936.

Breckel, Werner: *See—*
Felger, Gunter; Breckel, Werner; and Eichler, Dieter, 3,916,683.

Breer, Karl; and Schulte, Klaus, to Bayer Aktiengesellschaft. Introduction of reactants into moulds and article produced. 3,917,779, Cl. 264-46.500.

Breglia, Denis R.: *See—*
Mohon, Windell N.; Breglia, Denis R.; and Rodemann, Alfred H., 3,916,536.

Brehe, Harold C., to Minnesota Mining and Manufacturing Company. Method of making magnetic heads and the like. 3,916,511, Cl. 29-603.000.

Breiner, Frank S., to Steelcase Inc. Partition system. 3,916,972, Cl. 160-135.000.

Breitenstein, Richard C.: *See—*
Hochmann, Eugene; and Breitenstein, Richard C., 3,916,545.

Bremshey, Manfred, to Telesco Brophey Limited. Umbrella. 3,916,927, Cl. 135-26.000.

Brent, Burton David: *See—*
Seeling, Philip; and Brent, Burton David, 3,916,910.

Breslow, David S., to Hercules Incorporated. Polyfunctional quaternary amidoximidinium salts. 3,917,698, Cl. 260-564.00G.

Breton, Ernest J.; Wolf, Jack D.; Worden, Dexter; and Bailey, John T., to Mallory Composites, Inc. Process of preparing embossed sintered articles of manufacture. 3,917,149, Cl. 228-124.000.

Brett, John J.; Eidelberg, Jonah; and Mooney, Thomas, to Electrical Fittings Corporation. Liquid-tight swivel coupler for electrical conduit. 3,916,501, Cl. 29-437.000.

Brewer, Donald; Jerram, William Arthur; and Taylor, Alan, to Canadian Patents & Development Ltd. Antibiotic cochliodinol and production by chaetomium, cochliodes and chaetomium globsum. 3,917,820, Cl. 424-122.000.

Brewer, Everett H.: *See—*
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Brewster, Linda C.: *See—*
Hasegawa, Shin; Brewster, Linda C.; and Maier, Vincent P., 3,917,512.

Breyer, Walter Herman; Edelson, Nathan Allen; Gilliland, Barbara Faye; and Schatz, Clarence Henry, to Scott Paper Company. Multilayer one-piece disposable diapers. 3,916,900, Cl. 128-287.000.

Bricher, Charles W., to Tennant Company. Ice resurfacer cutting blade apparatus. 3,917,350, Cl. 299-24.000.

Bricher, Kenneth J. Shallow display and digital clock including reflecting and masking means. 3,918,052, Cl. 340-366.00E.

Bridgeford, Douglas J., to Tee-Pak, Inc. Method for patching edible artificial collagen sausage casings. 3,917,862, Cl. 426-274.000.

Bridgestone Tire Co., Ltd.: *See—*
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British Leyland (Austin-Morris) Limited: *See—*
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British Leyland Truck & Bus Division Ltd.: *See—*
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Bronshtein, Isaal Iosifovich: *See—*
Merzhanian, Artemy Arutjunovich; Brusilovsky, Sergei Alexeevich; Sarishvili, Naskid Grigorievich; Kishkovsky, Zbignev Nikolaevich; Bronshtein, Isaal Iosifovich; and Gagarin, Mikhail Alexeevich, 3,916,775.

Brooks, Eugene N., Jr., to United States of America, Navy. Twin cushion surface effect vehicle. 3,917,022, Cl. 180-127.000.

Brooks, Geoffrey O.; and Crellin, Robin A., to Brown & Williamson Tobacco Corporation. Smoking articles. 3,916,914, Cl. 131-10.00A.

Brooks, Robert W.: *See—*
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Brown, Cicero C. Pipe handling apparatus. 3,916,500, Cl. 29-240.000.

Brown, Edward A., to W. A. Brown & Son, Inc. Pressure release port for a walk-in freezer or the like. 3,916,643, Cl. 62-410.000.

Brown, Gary G.: *See—*
Waterman, Dwight Ray; Brown, Gary G.; and Mills, George J., 3,917,783.

Brown, James D.: *See—*
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Brown, Leanne M.: *See—*
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Brown Manufacturing Company: *See—*
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Brown, Melancthon S., deceased (by Kohn, Gustave K., Special Administrator), to Chevron Research Company. O,S-dihydrocarbyl-N-alkylthio- or N-arylthio phosphoroamidothioates as insecticides. 3,917,845, Cl. 424-215.000.

Brown, Richard Edward, to Scovill Manufacturing Company. Self-sealing break-away fitting. 3,916,929, Cl. 137-68.000.

Brown, Robert R., Jr., to Raymond Lee Organization, Inc., The, a part interest. Beverage stirrer. 3,917,234, Cl. 259-1.00R.

Brown, Rollen E.; and Girdwood, James, to Utex, Inc. Carrier for cassettes. 3,917,067, Cl. 206-387.000.

Brown & Root, Inc.: *See—*
Koehler, Albert M., 3,916,594.

Brown, William E.; Levine, Charles A.; and Tsang, Floris Y., to Dow Chemical Company, The. Method of grinding solder glasses. 3,917,490, Cl. 136-6.00F.

Brown, William L., to SI Handling Systems, Inc. Lane brake assembly. 3,917,044, Cl. 193-40.000.

Brown & Williamson Tobacco Corporation: *See—*
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Browning-Ferris Industries, Inc.: *See—*
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Browning, Vernon D.: *See—*
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Broxholm, Thomas M.: *See—*
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Brozenske, Donald Alan: *See—*
Klassen, David Dubble; and Brozenske, Donald Alan, 3,916,495.

Bruckenstein, Stanley; and Miller, Barry, to Bell Telephone Laboratories, Inc. Operational amplifier circuitry with automatic self-biasing for enhanced voltage compliance. 3,918,005, Cl. 330-99.000.

Bruckner Apparatebau GmbH: *See—*
Schuierer, Manfred, 3,917,886.

Brudnak, Andrew, Jr.; and Isaacson, Jerrold A., to International Harvester Company. Rotary mower. 3,916,606, Cl. 56-13.400.

Bruni, Enrico: *See—*
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Brunswick Manufacturing Co., Inc.: *See—*
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Brusilovsky, Sergei Alexeevich: *See—*
Merzhanian, Artemy Arutjunovich; Brusilovsky, Sergei Alexeevich; Sarishvili, Naskid Grigorievich; Kishkovsky, Zbignev Nikolaevich; Bronshtein, Isaal Iosifovich; and Gagarin, Mikhail Alexeevich, 3,916,775.

Bruson, Herman Alexander, to Bjorksten Research Laboratories, Inc. Method for producing citric acid and citrates. 3,917,686, Cl. 260-535.00P.

Bruzzano, Gennaro J. Matchbook with cover locking means. 3,917,057, Cl. 206-104.000.

Bryant, George Macon: *See—*
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Bryden, William: *See—*
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Bryll, Medard Z., to Gateway Industries, Inc. Inertia locking retractor. 3,917,189, Cl. 242-107.400.

Buck, Keith E.; Kitrilakis, Sotiris; and Robinson, Thomas C., to Tecna Corporation. Respirator. 3,916,888, Cl. 128-145.600.

Buckley, John; Budziarek, Richard; Nicholas, Andrew John; and Vickers, Edward Jervis, to Imperial Chemical Industries Limited. Chemical compounds. 3,917,656, Cl. 260-349.000.

Budd, Walter J.: *See—*
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Budziarek, Richard: *See—*
Buckley, John; Budziarek, Richard; Nicholas, Andrew John; and Vickers, Edward Jervis, 3,917,656.

Buechel, Frederick F.; and Pappas, Michael J. Floating center prosthetic joint. 3,916,451, Cl. 3-1.910.

Buechner, Oskar: *See—*
Trieschmann, Hans-Georg; Pfannmueller, Helmut; Urban, Friedrich; Buechner, Oskar; Steigerwald, Klaus; and Ball, Wolfgang, 3,917,577.

Buglewicz, Neal J. Remote interrogator device. 3,917,905, Cl. 179-6.00E.

Bullock, Norman J.; Wendt, Frank W.; and DePas, Laddie A., to Goodman, Walter P.; and W. M. Cissell Manufacturing Company. Seam-busting apparatus and method. 3,916,546, Cl. 38-1.00B.

Bultaco, Compania Espanola Espanola De Motores, S.A.: *See—*
Smith, Fred W.; Jarman, Robert E.; and Shreve, Russell L., 3,917,313.

Bumpus, Francis Merlin; Khosla, Mahesh Chandra; and Smeby, Robert Rudolph. Des-asp^1-ile^{8}angiotensin II as a specific inhibitor for the release of aldosterone. 3,917,579, Cl. 260-112.500.

Bumpus, Francis Merlin; Khosla, Mahesh Chandra; and Smeby, Robert Rudolph. Des-asp[1]-thr[8] angiotensin II as a specific inhibitor for the release of aldosterone. 3,917,580, Cl. 260-112.500.
Bundy Corporation: *See*—
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Bunker Ramo Corporation: *See*—
Kuronen, John Michael, 3,917,983.
Peterson, George, 3,917,373.
Burger, William R.; Vince, Guy A.; and Mitchner, Joseph L., to NCR Corporation. Imprinting means for a computer access terminal. 3,916,785, Cl. 101-45.000.
Burgess & Associates, Incorporated: *See*—
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Burgess, Warren C., Jr., to Burgess & Associates, Incorporated. Method and apparatus for balancing asymmetric weights in a vibratory conveyor. 3,917,052, Cl. 198-220.0BC.
Burke, Noel L., to Tee-Pak, Inc. Edible collagen casing coated with an edible powder and method of preparing same. 3,917,855, Cl. 426-92.000.
Burkett, Francis L., to Dow Chemical Company, The. Egg carton. 3,917,152, Cl. 229-2.5EC.
Burkhart, Robert. Animated puppet. 3,916,562, Cl. 46-119.000.
Burlington Engineering Sales Co.: *See*—
West, Thomas B.; King, Ernest V.; and Hindman, William S., 3,916,653.
Buro Patent AG: *See*—
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Wood, Hamish Christopher Swan; Stuart, Alexander; Curran, Adrian Charles Ward; and Al-Hassan, Saieba, 3,917,674.
Burton, John S.; and Whitney, Ronald L., to Termina Data Corporation. Translational shutter system. 3,918,077, Cl. 354-234.000.
Burton, Richard J.: *See*—
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Butler, James J., Jr.: *See*—
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Butler, James R., to Automation Products, Inc. Rotary wrist actuator for industrial robots. 3,916,701, Cl. 74-57.000.
Buzawa, M. John; and Munnerlyn, Charles R., to Tropel, Inc. Catadioptric projection printer. 3,917,399, Cl. 355-43.000.
Byron Jackson Inc.: *See*—
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C. L. Frost & Son, Inc.: *See*—
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Cadorette, Serge: *See*—
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Caldwell, John R., to Xerox Corporation. Sheet inverter apparatus. 3,917,257, Cl. 271-65.000.
Caldwell, Russell E. Ice removing tool. 3,916,732, Cl. 81-3.00R.
Caley, Lloyd E., to Boeing Company, The. Centerpoint drill grinding machine. 3,916,570, Cl. 51-95.0WH.
Callander, George C.: *See*—
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Cam Industries, Inc.: *See*—
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Camble, Roger; Gregory, Harold; and Gerring, Ernest Edward Lawrence, to Imperial Chemical Industries Limited. Pharmaceutical compositions containing epidermal growth factor or closely related derivatives thereof for inhibiting the secretion of acidic gastric juice in warm blooded animals. 3,917,824, Cl. 424-177.000.
Cameron Iron Works, Inc.: *See*—
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Campbell, Duncan Islay. Trolleys. 3,917,076, Cl. 214-1.00D.
Canada, Joel I.; and Neal, Eugene A., to Sonoco Products Company. Business machine core. 3,917,185, Cl. 242-68.500.
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Carder Industries, Inc.: *See*—
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Carlisle, Neil K.; and Pettee, James L., to GTE Sylvania Incorporated. Cover. 3,916,967, Cl. 150-52.00R.
Carlsmith, Lawrence A., to Ingersoll-Rand Company. Disintegrating-and-blowing apparatus for material such as pulp. 3,917,176, Cl. 241-55.000.
Carlson, David J., to RCA Corporation. Signal translation using the substrate of an insulated gate field effect transistor. 3,917,964, Cl. 307-304.000.
Carlson, Roland W., to United States Steel Corporation. Fluoroscopic screen which is optically homogeneous. 3,917,950, Cl. 250-483.000.
Carmien, Joseph Allen; and Yuhos, John R., to Nupla Corporation. Insert for attaching fiberglass tool handles. 3,917,421, Cl. 403-12.000.
Carn, Patrick. Load lifting and transporting arrangement. 3,917,083, Cl. 214-38.0CA.
Carney, Robert L., to Zoecon Corporation. Preparation of fatty acid esters. 3,917,662, Cl. 260-410.90R.
Carpenter, David M.; and Howard, Stephen F., to Coats Company, Inc., The. Adaptor for tire changing stands. 3,916,971, Cl. 157-1.240.
Carrier Drysys Ltd.: *See*—
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Carson, Chester C.; Barton, Sterling C.; and Echeverria, Federico S., to General Electric Company. Gas chromatographic analysis of pyrolysis products. 3,916,671, Cl. 73-23.100.
Carson, Miles Thomas. Vehicle rack mounting means. 3,917,136, Cl. 224-42.10F.
Carthew, Maximilian Kurt, to Carrier Drysys Ltd. Heat recovery systems. 3,917,444, Cl. 432-72.000.
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Cassinelli, Giuseppe, to Calze Malerba S.p.A. Apparatus for producing panty hose. 3,916,808, Cl. 112-63.000.
Caswell, Robert L., to Rockwell International Corporation. Simplified micropositioner. 3,917,385, Cl. 350-252.000.
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Cavalla, John Frederick; and Archibald, John Leheup, to John Wyeth & Brother Limited. 1-Pyrrolyl alkylene-piperidines. 3,917,614, Cl. 260-293.710.
Cavazza, Claudio, to SIGMA-TAU Industrie Farmaceutiche Riunite S.p.A. Dosage cap and container for powders or liquids. 3,917,129, Cl. 222-454.000.
Cawthorne, Charles William; and Abramson, Ian John. Coin primed device for checking and supporting an article. 3,917,047, Cl. 194-74.000.
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Centre de Recherches Metallurgiques — Centrum Voor Research in de Metallurgie: *See*—
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Chapman, Richard D.; and Pickett, Oscar A., Jr., to Monsanto Company. Process for preparing melt-stable poly(dodecamethyleneterephthalamide. 3,917,561, Cl. 260-45.75C.
Charles E. Frosst & Co.: *See—*
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Chauvette, Robert R., to Eli Lilly and Company. Cephalosporin ethers. 3,917,587, Cl. 260-243.00C.
Chauvette, Robert R., to Eli Lilly and Company. α-Aminoacyl cephalosporin ethers. 3,917,588, Cl. 260-243.00C.
Chen, Augustin T.; and Farrissey, William J., Jr., to Upjohn Company, The. Resinous polybarbituric acid derivatives. 3,917,572, Cl. 260-77.50R.
Chenevert, Edward L.; LaBorde, Joseph N.; and Waltman, Robert E., to Ethyl Corporation. Method of making thermal barrier lineal metal shapes. 3,916,503, Cl. 29-450.000.
Cheney, George T., to Nashua Corporation. Disc cartridge including draw plate. 3,917,068, Cl. 206-444.000.
Cheng, Ming Tzu: *See—*
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Kobzina, John W., 3,917,592.
Michlmayr, Manfred Josef, 3,917,565.
Chibret, Jean; and Manni, Charles, to Societe d'Emballage et de Conditionnement. Packages enabling the extemporaneous preparation of suspensions or sterile solutions. 3,917,063, Cl. 206-221.000.
Chicago Lock Co.: *See—*
Steinbach, Robert L., 3,916,657.
Child, Edward T.: *See—*
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Christensen, George L. Cartridge Holder. 3,917,135, Cl. 224-14.000.
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Chrysler United Kingdom Limited: *See—*
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Chupp, Vernon L.; and Duffield, Jack J., to Cary Instruments. Method of correlation spectroscopy utilizing an asymmetric double pass grating monochromator. 3,917,403, Cl. 356-74.000.
Ciaffone, John T., to Warner-Lambert Company. Spout for dispensing a foamable product. 3,917,121, Cl. 222-146.0HA.
Ciba-Geigy Corporation: *See—*
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Moser, Hans; and Vogel, Christian, 3,917,478.
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Clark, Clifford D., to Bundy Corporation. Tube deburring tool. 3,917,428, Cl. 408-130.000.
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Sisson, Ronald L.; and Shellberg, James E., 3,916,710.
Sisson, Ronald L.; and Shellberg, James E., 3,916,714.
Visser, Peter J., 3,917,088.
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Clark, Paul M.: *See—*
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Clark, Robert John, to RCA Corporation. High-resolution digital generator of graphic symbols with edging. 3,918,039, Cl. 340-324.0AD.
Clarke, E. Colin W.; Gilbert, Jeffrey F.; and Glew, David N., to Dow Chemical Company, The. Sulfurless electrolytic concentration of aqueous sulfuric acid solutions. 3,917,521, Cl. 204-149.000.
Clary, John G., to Addmaster Corporation. Drum series printer with type members arrested by staggered stop pawls. 3,916,786, Cl. 101-93.370.
Clas, Wilhelm; and Horstkorte, Helmut, to Henkel & Cie GmbH. Plastisols containing bonding aids. 3,917,550, Cl. 260-23.0EP.
Clauss, Karl; and Jensen, Harald, to Hoechst Aktiengesellschaft. Process for the manufacture of 6-methyl-3,4-dihydro-1,2,3-oxathiazine-4-one-2,2-dioxide. 3,917,589, Cl. 260-243.00R.
Claxton, Dale H.; and Liccini, Raymond P., to TRW Inc. Gunn effect phase modulator. 3,918,009, Cl. 332-9.00T.
Cleary, James Mansfield, Jr. Mining method involving sliding block of overburden on gel lubricant. 3,917,349, Cl. 299-13.000.
Clemens, James D. Identified wrench adaptor. 3,916,736, Cl. 81-185.000.
Clinton, Henry H. Movable brush assembly for making electrical contact with the outer surface of an electrical cable. 3,917,995, Cl. 324-54.000.
Clouse, Jerry A.; Parks, John H.; and Potter, Millard D., to Caterpillar Tractor Co. Torque rise limiting device. 3,916,862, Cl. 123-140.0MC.
Cloyd, Harold S., to Nosco Plastics, Incorporated. Syringe seals and piston. 3,916,894, Cl. 128-220.000.
Cloyd, Harold S., to Nosco Plastics, Incorporated. Palletized load with compression frame. 3,917,066, Cl. 206-386.000.
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Swisher, George W., Jr.; Hopkins, Michael F.; and Gepfert, Robert K., 3,917,084.
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Coldewey, Heiko: *See—*
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Coleman, Harold R., to Tee-Pak, Inc. Process for coating regenerated cellulose film and the coated film. 3,917,894, Cl. 428-414.000.
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Collins, John D., to Raytheon Company. Time compression system adding noise to allow one bit quantization. 3,918,054, Cl. 343-5.0DP.
Collins, Joseph C., to Sterling Drug Inc. Cyclopropyl carbinol derivatives. 3,917,718, Cl. 260-613.00R.
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Comstock, Alfred E.; and Wilcox, Burdsal, to Safeway Stores, Incorporated. Method for cutting and handling block-like articles. 3,916,741, Cl. 83-27.000.
Conacher, Philip, Jr., to Du Pont de Nemours, E. I., and Company. Elastomeric polyurethane parts produced by liquid injection molding. 3,917,792, Cl. 264-328.000.
Conner, Charles J., to United States of America, Agriculture. Single bath fungicidal chrome-zirconyl acetate mineral dyeing process for cellulosics. 3,917,446, Cl. 8-52.000.
Connery, James G.; Moreland, George R.; and Underkoffler, Victor S., to Leeds & Northrup Company. Electrochemical cell assembly. 3,917,524, Cl. 204-195.00R.
Connor, Paul: *See—*
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Conzelmann, Gerhard; and Seiler, Hartmut, to Robert Bosch GmbH. Method of making a reference voltage source with a desired temperature coefficient. 3,916,508, Cl. 29-574.000.
Cook, Thomas A.; Hudson, Marshall C.; and Racki, Jerome G., to Corning Glass Works. Optical waveguide bundle connector. 3,917,383, Cl. 350-96.00C.
Cooke, William C.; and Agett, Albert H., to ASG Industries Inc. Fragmentation shield for impact resisting optical medium. 3,917,891, Cl. 428-337.000.
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Costil, Marcel. Cutting-tool grinding method. 3,916,582, Cl. 51-288.000.
Cotten, Bennett D. Cotton roll holder and lip retractor. 3,916,879, Cl. 128-12.000.
Cotter, Robert J.; and Keogh, Michael J., to Union Carbide Corporation. Method for the removal of sulfur dioxide from gas mixtures. 3,917,469, Cl. 55-73.000.
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Courtin, Erich; and Traub, Stefan, to Hewlett-Packard GmbH. Circuit arrangement for producing a pulse sequence corresponding to a foetal cardiac rhythm. 3,916,878, Cl. 128-2.06F.
Cousino, James L., to Lakeway Chemicals, Inc. Reduction of certain 2,2'-disubstituted azoxybenzenes and azobenzenes to corresponding hydrazobenzenes. 3,917,701, Cl. 260-569.000.
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Cox, David E. Enclosed housing for gas tank stands. 3,916,587, Cl. 52-27.000.
CPC International Inc.: *See—*
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Crawford, James Darwin; and Pankow, Bernd, to Combustion Engineering, Inc. Reactor vessel supported by flexure member. 3,916,944, Cl. 137-376.000.
Crellin, Robin A.: *See—*
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Cross, Walter A. Timer controlled high and low temperature thermostat. 3,917,165, Cl. 236-46.000.
Crossland, Ronald K.; and Harlan, James T., Jr., to Shell Oil Company. Block copolymer adhesive compositions. 3,917,607, Cl. 260-28.50B.
Crouch, Lindsley B., to Cuba Specialty Mfg. Co., Inc. Coupling device for a sectional minnow trap. 3,916,558, Cl. 43-65.000.
Crover, Stephen E., to Ackley Manufacturing Co. Concrete breaker construction and valve mechanism. 3,916,764, Cl. 91-235.000.
Crowe, Curtis W., to Dow Chemical Company, The. Aqueous based emulsion for treating subterranean formations. 3,917,535, Cl. 252-8.55C.
Crowe, Curtis W., to Dow Chemical Company, The. Composition and method for acidizing earthen formations. 3,917,536, Cl. 252-8.55C.
Crowell, Edward G., Sr. Root treating device. 3,916,564, Cl. 47-48.500.
Crump, Desmond George, to Phido (Wire Services) Co., Ltd. Cable cleaning units. 3,916,925, Cl. 134-172.000.
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Wood, Hamish Christopher Swan; Stuart, Alexander; Curran, Adrian Charles Ward; and Al-Hassan, Saieba, 3,917,674.
Cuscino, Thomas A., to United States Steel Corporation. Method and mechanism for operating the locking means for chill plate of a rigid starter bar. 3,916,980, Cl. 164-82.000.
Cusic, John W.; and Levon, Ernest F., to G. D. Searle & Co. N-(2-(nitro-1-imidazolyl)ethyl)imides. 3,917,636, Cl. 260-309.500.
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D'Angelo, Antonio Joseph; Mageli, Orville Leonard; and Sheppard, Chester Stephen, to Pennwalt Corporation. Coupled peroxides as crosslinking initiators. 3,917,745, Cl. 260-861.000.
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Date, Tasuku; Nakano, Soichi; and Iizuka, Yoshitoku, to Honda Giken Kogyo Kabushiki Kaisha. Intake and exhaust manifold assembly for internal combustion engine. 3,916,850, Cl. 123-52.00M.
Daugirdas, Kristupas, to Vapor Corporation. Obstruction sensor for pneumatic door operator. 3,916,567, Cl. 49-28.000.
Daunderer, Heinz; and Meiller, Hermann, to Georg Grammer. Device for varying the vertical separation and the relative longitudinal inclination. 3,917,211, Cl. 248-421.000.
Davey, James Andrew; Perry, Charles B.; and Rohmiller, Harvey William, to Cincinnati Milacron Inc. Method and apparatus for adaptively positioning a machine element. 3,917,930, Cl. 235-151.110.
Davidson, Donald H.; and Huff, Ray V., to Kennecott Copper Corporation. Well stimulation for solution mining. 3,917,345, Cl. 299-5.000.
Davidson, Douglas B.; and Sines, Randy D. Billard game apparatus. 3,917,264, Cl. 273-3.00R.
Davidson, Samuel L.; Heidenreich, William C.; and Hunter, Phillip, to Delhi Manufacturing Corporation. Stackable boat. 3,916,466, Cl. 9-2.00S.

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Davis, Paul Knight, to Pacific Roller Die Co., Inc. Implantable heart pump. 3,916,449, Cl. 3-1.700.
Davis, Robert F.; and Swanson, Carl I., to Walter Kidde & Co., Inc. Fire protection system. 3,917,001, Cl. 169-61.000.
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De Felice, Wilfried, to Hoechst Aktiengesellschaft. Single-injection device. 3,916,893, Cl. 128-218.00R.
De Filippi, Quinto. Container closure fastening means. 3,917,328, Cl. 292-7.000.
DeGois, Michel Louis; and Gouvenel, Daniel Christian, to Pont-A-Mousson S.A. Method for obtaining spheroidal graphite castings. 3,916,979, Cl. 164-57.000.
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del Rio, Eddy Humberto, to RCA Corporation. Embossed character reader. 3,917,925, Cl. 235-61.11C.
Dendy, John C.; and Miller, Ronald J., to Sperry Rand Corporation. VTOL craft deceleration control system. 3,916,688, Cl. 73-178.00T.
Denes, Peter Bernard, to Bell Telephone Laboratories, Incorporated. Decoding circuit for variable length codes. 3,918,047, Cl. 340-347.0DD.
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De Rosa, Daniel, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Inflatable sun visor. 3,917,023, Cl. 280-150.0AB.
deRosset, Armand J., to Universal Oil Products Company. Process for the separation of ethylbenzene. 3,917,734, Cl. 260-674.0SA.
Descamps, Marcel; and Areschka, Alex, to Labaz. 2-(Benzofuran)-acetamidines. 3,917,600, Cl. 260-268.0BC.
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Dewas, Raymond. Tape drive in weaving machines. 3,916,957, Cl. 139-123.000.
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Dezawa, Shin-Ichiro; and Kitamoto, Tatsuji, to Fuji Photo Film Co., Ltd. Method for raising the curie point of ferromagnetic chromium dioxide. 3,917,716, Cl. 423-607.000.
Dhawan, Bhola Nath: *See—*
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Dialight Corporation: *See—*
Towne, Herbert; and Rapp, Harold, 3,918,053.
Diamond, Julius; and Santora, Norman Julian, to William H. Roher, Inc. Phenylacetic acids in reducing pain, fever and inflammation. 3,917,846, Cl. 424-317.000.
Diamond Shamrock Corporation: *See—*
Franks, Charles R.; Schenker, Barry A.; and Kolb, James M., 3,917,518.
Diapouli, Irene H., administrator: *See—*
Petzetakis, Aristovoulos George, deceased; Diapouli, Irene H., administrator; Petzetakis, Nikolas G., administrator; and Petzetakis, Menelaos G., administrator, 3,917,500.
Di Benedetto, Gilberto; and Thomson, James K., to Texas Instruments Incorporated. Area flood gun. 3,917,968, Cl. 313-272.000.
Di Chirico, Giuseppe. Control mechanism for compensating steering angles in vehicle directive wheels. 3,917,305, Cl. 280-93.000.
Di Cio, Alessandro; and Vitali, Angelo, to Prolizenz AG. Oxidation of benzene to maleic anhydride using a new catalyst. 3,917,655, Cl. 260-346.800.
Diego, Joseph: *See—*
Green Barg, Nathan M., 3,917,276.
Dilger, Lawrence. Liquid dispensing apparatus. 3,916,961, Cl. 141-46.000.
Dillingham, Edward: *See—*
Humphrey, John H.; and Dillingham, Edward, 3,918,028.
Dimitriu, Iustin-Gheorghe: *See—*
Todereanu, Corneliu; Dimitriu, Iustin-Gheorghe; Filip, Ioan-Romulus; and Ichim, Diona, 3,917,810.
Dionics, Inc.: *See—*
Kravitz, Bernard L.; and Seaton, George R., 3,918,083.
Display Corporation International: *See—*
Light, Thomas R., 3,917,113.
Display Enterprises, Inc.: *See—*
Sturdevant, Eugene J., 3,917,394.
Doane, Kenneth I., Sr.: *See—*
Madler, Herman J.; and Doane, Kenneth I., Sr., 3,917,306.
Dr. Ernst Fehrer Gesellschaft m.b.H. & Co., K.G. Textilmachinenfabrik u. Stahlbau: *See—*
Konig, Franz, 3,916,494.
Dodd, Richard Edward: *See—*
Gothard, John Floyd, Jr.; Dodd, Richard Edward; and Peterson, William Carl, 3,917,270.
Doi, Hidekazu; and Nishigaki, Kenichi, to Mitsubishi Metal Corporation. Heat resistant and wear resistant alloy. 3,916,497, Cl. 29-182.800.
Doi, Hidekazu; and Nishigaki, Kenichi, to Mitsubishi Metal Corporation. Nickel-base heat resistant and wear resistant alloy. 3,917,463, Cl. 29-182.800.
Doi, Toshitada: *See—*
Nakamichi, Koya; Doi, Toshitada; and Akiba, Kosuke, 3,918,063.
Doin, Bernard J.; Plantif, Bernard E.; and Tillac, Jean F., to Societe Nationale des Poudres et Explosifs. Novel pyrotechnic tensioning device for use with safety belts. 3,917,031, Cl. 188-1.00C.
Domian, Robert E.; and Sophinos, Nicholas, to Colt Industries Operating Corporation. Cylinder lock for double action revolver. 3,916,551, Cl. 42-67.000.
Domig, Rene: *See—*
Loepfe, Erich; and Domig, Rene, 3,916,687.
Dominguez-Armada, Pedro. Portable bidet. 3,916,453, Cl. 4-7.000.
Dominy, Beryl William: *See—*
Abu El-Haj, Marwan J.; and Dominy, Beryl William, 3,917,624.
Doncasters Moorside Limited: *See—*
Stansfield, Fred; and Roe, Michael James, 3,917,224.
Donnelly, Joseph E., to Simmonds Precision Products, Inc. Capacitance fuel tank gauge. 3,916,689, Cl. 73-304.00C.
Donohue, James M.; and Mueller, Daniel L., to Xerox Corporation. Control system. 3,917,396, Cl. 355-14.000.
Dor, Abraham A.: *See—*
McGauley, Patrick John; and Dor, Abraham A., 3,917,800.
Doring, Erich Heinrich. Reproducing unit and sound carrier for use with pages of a book and the like. 3,917,284, Cl. 274-9.00C.
Dornan, Arthur E.: *See—*
Radcliffe, Stanley L.; and Dornan, Arthur E., 3,917,040.

Dorofachuk, Gus; and Gosselin, Paul, to Stone Container Corporation. Display package. 3,917,158, Cl. 229-51.0TS.

Dorsman, Adrian K., to Rockwell International Corporation. Analog-to-digital conversion apparatus. 3,918,050, Cl. 340-347.0AD.

Dotson, Anderson O., Jr.: *See—*
Wolford, Lionel T.; Newcombe, Jack; and Dotson, Anderson O., Jr., 3,917,642.

Doty, William T., to Maryland Cup Corporation. Method and apparatus for heat shrink capping containers. 3,916,602, Cl. 53-329.000.

Doudlebsky, Ctibor; Jaros, Frantisek; Cap, Antonin; Ferka, Frantisek; Ripka, Josef; and Junek, Jan, to Vyzkumny ustav bavlnarsky. Strand separating and stripping apparatus. 3,916,485, Cl. 19-65.00R.

Douglas, Larry J.; and Wenger, Charles B., to Marathon Oil Company. Oil recovery with high conductivity micellar systems. 3,916,997, Cl. 166-275.000.

Douros, John D., Jr.: *See—*
Kerst, Al F.; and Douros, John D., Jr., 3,917,476.

Dove, Douglas J. A., to Interstore Transfer Specialists, Inc. Container suited for an expanded volume or reduced volume configuration. 3,917,154, Cl. 229-23.00R.

Dow Chemical Company, The: *See—*
Brown, William E.; Levine, Charles A.; and Tsang, Floris Y., 3,917,490.
Burkett, Francis L., 3,917,152.
Clarke, E. Colin W.; Gilbert, Jeffrey F.; and Glew, David N., 3,917,521.
Crowe, Curtis W., 3,917,535.
Crowe, Curtis W., 3,917,536.
Farber, Hugh A., 3,917,697.
Gibbs, Dale S.; Simons, Paul B.; Vandell, Robert D.; and Wessling, Ritchie A., 3,917,574.
Harty, M. Fillmore, 3,916,460.
Kroposki, Lorraine M.; Yoshimine, Masao; and Freedman, Harold H., 3,917,621.
Olstowski, Franciszek; and Parrish, Donald B., 3,917,571.
Vrieland, G. Edwin; and Friedli, Hans R., 3,917,732.

Dower, Ethell J., to Drill-Au-Mation, Inc. Dual pump control systems. 3,917,436, Cl. 417-5.000.

Drabek, Jozef; Boger, Manfred; and Kristiansen, Odd, to Ciba-Geigy Corporation. 0-Alkyl-5-alkyl-0-(substituted phenyl)thiolphosphates. 3,917,752, Cl. 260-949.000.

Dragerwerk Aktiengesellschaft: *See—*
Eckstein, Wolfgang; and Anklam, Wolfgang, 3,917,456.
Freytag, Klaus; and Benn, Manfred, 3,916,891.

Dresser Industries, Inc.: *See—*
Dyer, Norman Dean; and Mitchell, Howard Earl, 3,917,009.
Ellis, Gary Dale; and Foster, Joe Drahn, 3,916,999.
Rose, Willis Earl, 3,917,431.

Drill-Au-Mation, Inc.: *See—*
Dower, Ethell J., 3,917,436.

Dua, Prithvi Raj: *See—*
Saxena, Anil Kumar; Jain, Padam Chand; Singh, Gurbuksh; Dua, Prithvi Raj; Srimal, Rikhab Chand; Dhawan, Bhola Nath; and Anand, Nitya, 3,917,599.

Dubuit, Louis Gilbert. Machine for printing on articles having two inking stations and a single printing station common thereto. 3,916,784, Cl. 101-41.000.

Duddy, James J. Magnetic base utility lamp. 3,917,940, Cl. 240-52.150.

Duffield, Jack J.: *See—*
Chupp, Vernon L.; and Duffield, Jack J., 3,917,403.

Dufour, Henri: *See—*
Bouniot, Albert; and Dufour, Henri, 3,917,712.

Dufour, Raymond J., to Institute of Gas Technology. Heat exchange apparatus. 3,916,869, Cl. 126-110.00R.

Dukess, Joseph. Closure with rotatable layered liner. 3,917,100, Cl. 215-329.000.

Dunham, George: *See—*
Williams, Robert L.; and Dunham, George, 3,917,045.

Dunlop Limited: *See—*
Owens, Geoffrey Lloyd, 3,916,970.

Du Pont de Nemours, E. I., and Company: *See—*
Adams, Philip Edgar; and Willis, Frank Marsden, 3,916,598.
Conacher, Philip, Jr., 3,917,792.
Henry, Cyrus Pershing, Jr., 3,917,466.
Konopik, Alvin E.; and Kusko, James D., 3,917,798.
Rice, Warren Wesley, 3,917,756.
Scheuerlein, Edwin Louis; and Starr, Frank Clyde, Jr., 3,917,761.
Schroeder, Herman Elbert; and Wolfe, James Richard, Jr., 3,917,743.
Short, Oliver Alton, 3,917,487.
Vogl, Otto F., 3,917,546.
Williams, John Ronald; and Lenz, Terry Gene, 3,917,707.

Duran, John A., to Avibank Mfg. Inc. Rotatable locking mechanism having movable detents. 3,917,331, Cl. 292-338.000.

Durand, James C., to Caterpillar Tractor Co. Replaceable insert for the drive sprocket of a track-type vehicle. 3,916,708, Cl. 74-243.00R.

DuRocher, Gideon A., to Essex International, Inc. Multi-stage switching apparatus. 3,918,020, Cl. 338-114.000.

Duwel, Dieter: *See—*
Horlein, Gerhard; Mildenberger, Hilmar; Kroniger, Arno; Hartel, Kurt; Duwel, Dieter; and Kirsch, Reinhard, 3,917,635.

Dyer, Norman Dean; and Mitchell, Howard Earl, to Dresser Industries, Inc. Removable stem for raise bits. 3,917,009, Cl. 175-53.000.

Dynamit Nobel Aktiengesellschaft: *See—*
Eich, Johannes; and Brachert, Heinrich, 3,917,767.

Dzus Fastener Co., Inc.: *See—*
Dzus, Theodore, 3,916,550.

Dzus, Theodore, to Dzus Fastener Co., Inc. Animal marker. 3,916,550, Cl. 40-300.000.

E. R. Squibb & Sons, Inc.: *See—*
Krapcho, John, 3,917,678.
Narayanan, Venkatachala L.; and Bernstein, Jack, 3,917,689.

E. Schnitzler GmbH & Co.: *See—*
Schnitzler, Erwin; and Schnitzler, Ulrich, 3,916,825.

E-Systems, Inc.: *See—*
Usry, Joe D., 3,916,941.

E-Z Por Corporation: *See—*
Levin, Myron M., 3,917,131.

Earl, Roscoe T., to Baxter Laboratories, Inc. Meat tenderizing system. 3,916,777, Cl. 99-533.000.

Eastman Kodak Company: *See—*
Bailey, David S., 3,917,484.
Hoyle, Vinton A., 3,917,604.
Morgan, John, 3,917,485.
Pond, David M.; and Thweatt, John G., 3,917,710.
Reinke, Robert V.; Newton, John E.; and Reifsteck, Robert L., 3,918,068.
Watkins, Windell C., 3,917,673.

Eaton Corporation: *See—*
Behar, Marcel N.; and Morscheck, Timothy J., 3,916,728.
Obermaier, Frank E.; and Scott, Arthur A., 3,917,163.
Thorson, Clayton W., 3,916,932.
Ward, Harold R., 3,917,014.

Ebeling, Harold O., to Black, Sivalls & Bryson, Inc. Method of incinerating vent gas. 3,917,796, Cl. 423-210.000.

Echeverria, Federico S.: *See—*
Carson, Chester C.; Barton, Sterling C.; and Echeverria, Federico S., 3,916,671.

Eckelt, Michael: *See—*
Worschech, Kurt; Heyden, Rudi; Wolf, Kurt; Jaeckel, Manfred; and Eckelt, Michael, 3,917,555.

Eckstein, Victor, to Ringprism Pty. Limited. Lens system. 3,917,388, Cl. 352-113.000.

Eckstein, Wolfgang; and Anklam, Wolfgang, to Dragerwerk Aktiengesellschaft. Alcohol breath testing set. 3,917,456, Cl. 23-254.00R.

Ecodyne Corporation: *See—*
Furlong, Donn B.; Gobler, Harry W.; and Grotheer, Robert, 3,917,765.

Edelson, Nathan Allen: *See—*
Breyer, Walter Herman; Edelson, Nathan Allen; Gilliland, Barbara Faye; and Schatz, Clarence Henry, 3,916,900.

Edwards, Philip Neil, to Imperial Chemical Industries Limited. 3,6-Dioxa-1,8-octandiamido bis (pyridinium) compounds. 3,917,626, Cl. 260-295.50A.

Egger, Erwin, to Decobul S.A. Lockable rotatable knob. 3,916,721, Cl. 74-553.000.

Eguchi, Takeo, to Sony Corporation. Apparatus and method for reproducing recorded color video signals. 3,917,415, Cl. 358-4.000.

Ehlenbeck, Gary J. Pipe clamp for resisting rotational forces. 3,917,423, Cl. 403-204.000.

Ehrenreich Photo Optical Industries, Inc.: *See—*
Roll, Guy, 3,917,201.

Eich, Johannes; and Brachert, Heinrich, to Dynamit Nobel Aktiengesellschaft. Process for the preparation of multiple-base propellant powder. 3,917,767, Cl. 264-3.00C.

Eichler, Dieter: *See—*
Felger, Gunter; Breckel, Werner; and Eichler, Dieter, 3,916,683.

Eichner, Jack Michael: *See—*
Schrier, Michael Robert; and Eichner, Jack Michael, 3,917,265.

Eidelberg, Jonah: *See—*
Brett, John J.; Eidelberg, Jonah; and Mooney, Thomas, 3,916,501.

Eikelberger, Rand J.: *See—*
Sidor, Edward F.; and Eikelberger, Rand J., 3,917,970.

Eiki, Hiroshi, to Tohkai Denkia Tosoh Kabushiki Kaisha. Incinerator. 3,916,807, Cl. 110-14.000.

Eisemann, Kurt, to U.S. Philips Corporation. Switch-off device for a record changer. 3,917,282, Cl. 274-1.00R.

Eisenberger, Gary; and Muzslay, Steven Z., to Optigon Research & Development Corporation. Radiation sensitive flash apparatus. 3,917,944, Cl. 250-239.000.

Eisenkopf, Hermann, to Ernst Leitz GmbH. Apparatus for compensation of dimensional position changes. 3,916,528, Cl. 33-125.00C.

Ekimov, Vadim Petrovich: *See—*
Mogilevsky, Vitaly Moritsovich; Ekimov, Vadim Petrovich; and Abrosimov, Eduard Alexeevich, 3,917,994.

Elast-O-Flex, Inc.: *See—*
Gregoire, Marc, 3,917,360.

Elbe, Maximo, to Colorant Schmuckstein GmbH. Apparatus for grinding a gem stone. 3,916,573, Cl. 51-118.000.

Electrical Fittings Corporation: *See—*
Brett, John J.; Eidelberg, Jonah; and Mooney, Thomas, 3,916,501.

Electrostatic Equipment Corporation: *See—*
Knudsen, Walter Ganter, 3,916,826.

Elfman, Allan M.: *See—*
Lemelson, Jerome H.; and Elfman, Allan M., 3,917,271.

Elgaard, Christen Hagbard, to Terma Elektronisk Industri A/S. Velocity measuring doppler radar. 3,918,061, Cl. 343-8.000.

Elge Establishment: *See—*
Marocco, Antonio, 3,917,218.

Eli Lilly and Company: *See—*
Chauvette, Robert R., 3,917,587.

Chauvette, Robert R., 3,917,588.
Chou, Ta-Sen, 3,917,644.
Molloy, Bryan B.; and Tuttle, Ronald R., 3,917,679.
VandenBerg, Willard J.; Ramsey, Robert E.; Bollman, Robert L.; Krackenberger, Richard E.; and Pieczko, George, 3,917,055.

Ellis, Gary Dale; and Foster, Joe Drahn, to Dresser Industries, Inc. Retention sleeve for well tools and method of use thereof. 3,916,999, Cl. 166-302.000.

Ellis, Gwynn Pennant; Ridgway, Heulwen Moira; and Bays, David Edmund, to Allen & Hanburys Limited. Substituted 6,7 dihydro-1-oxo N(1H-tetrazol-5-yl)-1H,5H-benzo[ij]quinolizine carboxamides. 3,917,608, Cl. 260-287.00P.

Elmore, Austin E.; and Uhlmann, Ernest A. Colostomy irrigation device. 3,916,897, Cl. 128-245.000.

Elmore, Lester C.; and Broxholm, Thomas M., to Pulsepower Systems, Incorporated. Liquid propellant weapon. 3,916,792, Cl. 102-38.000.

Elmslie, Keith W.: *See—*
Lane, George C.; Cartwright, Cyril A.; and Elmslie, Keith W., 3,916,523.

Elsdon, Austin A. Penetrating oil compositions. 3,917,537, Cl. 252-11.000.

Elsworth, Robert M., to General Electric Company. Container positioning apparatus. 3,916,964, Cl. 141-283.000.

Engard, Ferenc: *See—*
Bak, Bela; Engard, Ferenc; and Szoke, Josef, 3,917,455.

Engelhard Minerals & Chemicals Corporation: *See—*
Baker, Kenneth D., 3,917,885.

Engineering Technology Analysts, Inc.: *See—*
Lovie, Peter M.; and Lowery, Edwin L., 3,916,633.

English, Christopher John, to Noranda Mines Limited. Apparatus for continuous casting of metal strips. 3,916,985, Cl. 164-281.000.

Engstrom, Keith A.: *See—*
Bernin, Victor M.; and Engstrom, Keith A., 3,918,051.

Enkkeli, Melvin: *See—*
Hawley, Lee E., 3,916,596.

Enoch, William K., to Textron, Inc. Attitude sensitive fuel tank vent valve. 3,916,928, Cl. 137-39.000.

Enoguchi, Yuji: *See—*
Tanaka, Susumu; Enoguchi, Yuji; and Kawabata, Hidetoshi, 3,917,397.

Ensing, Ernest. Eyeglass retainer. 3,917,387, Cl. 351-123.000.

Enviro-Blast International: *See—*
Rose, James J.; and Horton, Edward L., 3,916,568.

Envirotech Corporation: *See—*
Hoon, Harry E., Jr., 3,917,177.

Erapa AG: *See—*
Gutjahr, Paul; and Luthi, Hans, 3,916,779.

Erickson, Linwood P., to G.W. Dahl Company, Inc. Thermal shut-off valve. 3,916,930, Cl. 137-75.000.

Eriksson, Sven Erik Nore, to Atlas Copco Akeiebolag. Loading machine. 3,917,089, Cl. 214-145.000.

Ernst Leitz GmbH: *See—*
Eisenkopf, Hermann, 3,916,528.

Ertley, Holmes E. Thin wall tubing deburring tool. 3,917,429, Cl. 408-227.000.

Erwin Kampf Maschinenfabrik, Firma: *See—*
Kampf, Herbert, 3,916,491.

Eshraghian, Kamran, to U.S. Philips Corporation. Quantity level gauge. 3,918,035, Cl. 340-244.00R.

Esibian, Eduard Migranovich: *See—*
Volkov, Igor Vladimirovich; Esibian, Eduard Migranovich; Alexandrov, Mikhail Mikhailovich; Zakrevsky, Stanislav Ivanovich; and Zhukovsky, Petr Grigorievich, 3,917,992.

Esselborn, Fred, to Timex Corporation. Contacting, locating and exchanging means for energy cells in timepieces. 3,916,613, Cl. 58-23.0BA.

Essex International, Inc.: *See—*
DuRocher, Gideon A., 3,918,020.
Hall, Thomas E.; and Hansen, Wallace A., 3,917,377.

Estes, James M.; Kerlin, Eliot E.; and Blum, Harold A. Flat plate solar collector module. 3,916,871, Cl. 126-271.000.

ETAT FRANCAIS: *See—*
Pichard, Paul; and Corbin, Lucien, 3,916,552.
Pierre, Bernard; Volle, Rene; and Simon, Georges, 3,916,762.

ETAT FRANCAIS - Delegation Ministerielle Pour L'Armement: *See—*
Tellie, Paul E., 3,916,530.

Ethridge, Fredrick Allen, to Fiber Industries, Inc. Fluid jet assembly for treating yarns. 3,916,493, Cl. 28-1.400.

Ethyl Corporation: *See—*
Bergeron, Charles R., 3,917,685.
Chenevert, Edward L.; LaBorde, Joseph N.; and Waltman, Robert E., 3,916,503.

Evans, James P., to Johnson, Paul H. Adjustable multiple purpose ratcheting wrench. 3,916,735, Cl. 81-165.000.

Evers, William J.; Heinsohn, Howard H., Jr.; Mayers, Bernard J.; and Karoll, Elizabeth A., to International Flavors & Fragrances Inc. 3-Furyl thioesters to impart meaty aroma and taste. 3,917,869, Cl. 426-535.000.

Everst & Jennings, Inc.: *See—*
Rodaway, Keith S., 3,917,312.

Exxon Research & Engineering Company: *See—*
Baird, William C., Jr.; Hartgerink, Ronald L.; and Surridge, John H., 3,917,670.
Bosniack, David S., 3,917,895.
Bouboulis, Constantine J., 3,917,665.
Kalfadelis, Charles D.; and Skopp, Alvin, 3,916,805.

Fabris, Hubert J.; Herold, Robert J.; and Maxey, Edwin M., to General Tire & Rubber Company, The. Liquid copolymers of vinyl monomers and unsaturated diesters. 3,917,666, Cl. 260-465.400.

Fabris, Sergio. Snow monoski. 3,917,301, Cl. 280-12.00K.

Fabsco Corporation: *See—*
Beijen, James H., 3,917,132.

Fagersta AB: *See—*
Netterstedt, Sture; and Lindstrand, Bengt, 3,916,955.

Fages, Jean: *See—*
Abbes, Claude; Fages, Jean; Mengus, Georges; Rouaud, Christian; and de Villepoix, Raymond, 3,917,294.

Falckenberg, Richard; and Lindner, Herbert, to Siemens Aktiengesellschaft. Apparatus for the production of Verneuil crystals. 3,917,459, Cl. 23-273.00V.

Falt, Ingvar K. O.; Ljungberg, Per-Allan; and Soukup, Franz, to Deering Milliken Research Corporation. Device for loading of packages into transport containers. 3,916,600, Cl. 53-142.000.

Farber, Hugh A., to Dow Chemical Company, The. Polyethers having oxidized thioether side chains. 3,917,697, Cl. 260-563.00R.

Farge, Daniel; Messer, Mayer Naoum; and Reisdorf, Daniel, to Rhone-Poulenc, S.A. 1,4-Ethano-2,3 dihydroquinoline derivatives. 3,917,611, Cl. 260-288.00R.

Farmhand, Inc.: *See—*
Taylor, Howard W.; and Pedersen, Richard C., 3,917,343.

Farr, David Robert: *See—*
Arnaud, Michel; and Farr, David Robert, 3,917,851.

Farrissey, William J., Jr.: *See—*
Chen, Augustin T.; and Farrissey, William J., Jr., 3,917,572.

Fauser, Edwin; Schirmer, Gunter; Steinke, Leo; and Hellberg, Rainer, to Robert Bosch GmbH. Electronic ignition timing and timing shift circuit for internal combustion engines. 3,916,855, Cl. 123-117.00R.

Fearon, Robert E.: *See—*
Moran, William P.; and Fearon, Robert E., 3,916,699.

Feather, Peter; Kendle, Keith Emery; and Telford, John Michael, to BDH Pharmaceuticals Limited. 17α-(1;3'-alkadiynyl)-3-cycloalkoxy-17β-hydroxy (or alkoxy) oestra-1,3,5(10)-trienes. 3,917,658, Cl. 260-397.500.

Federal Investment Corporation: *See—*
O'Hare, Harry M., 3,917,172.

Feigin, Leon, to United Technologies Corporation. Laser tracking system. 3,917,381, Cl. 350-7.000.

Feldman, Beverly Ann: *See—*
Pankin, Jerome; and Feldman, Beverly Ann, 3,916,539.

Felger, Gunter; Breckel, Werner; and Eichler, Dieter, to Robert Bosch GmbH. Method and apparatus for testing the accuracy of intake air measurement of a motor fuel injection system. 3,916,683, Cl. 73-119.00A.

Fender, Malvin L.: *See—*
Robison, Russell O.; and Fender, Malvin L., 3,917,967.

Fengler, Richard R.: *See—*
Fengler, Werner H.; and Fengler, Richard R., 3,917,245.

Fengler, Werner H.; and Fengler, Richard R. Upstroke -cushioning expansible strut. 3,917,245, Cl. 267-120.000.

Fenske, Ellsworth R.; and Anderson, Robert F., to Universal Oil Products Company. Isoparaffin-olefin alkylation utilizing crystalline aluminosilicate catalyst in an adsorption zone. 3,917,738, Cl. 260-683.430.

Fenton, Marvin J., to Borden, Inc. Foreign particle detector. 3,917,947, Cl. 250-360.000.

Ferguson, John Gilbert; and Waters, Geoffrey Dallinger, to Rolls-Royce (1971) Limited. Seals and method of manufacture thereof. 3,917,150, Cl. 228-159.000.

Ferka, Frantisek: *See—*
Doudlebsky, Ctibor; Jaros, Frantisek; Cap, Antonin; Ferka, Frantisek; Ripka, Josef; and Junek, Jan, 3,916,485.

Ferrada, Stephen Salvador; Wisdom, Ronald David; and Fleming, Thomas Geoffrey Rex, to Chrysler United Kingdom Limited. Interior lights for motor vehicles. 3,917,938, Cl. 240-7.10R.

Ferrer, Carlos; and Colome, Juan, to Laboratories Ferrer S.I. Dihalogen-acetamino-benzylamines and process for preparing the same. 3,917,696, Cl. 260-562.00R.

Ferro Corporation: *See—*
Oswitch, Stanley; and Kipp, Kevin K., 3,917,790.

Ferrofluidics Corporation: *See—*
Rosensweig, Ronald E., 3,917,538.

Ferrucci, Lorenzo A.; and Hauser, Whitney J. R., to Yaleco Industries, Inc. Non-woven fabric-like rubbery material and process of manufacture. 3,917,501, Cl. 156-279.000.

Feuerstein, Roger F.; Freeman, Maurice A.; and Spinelli, Leonardo B., to General Electric Company. Borescope support apparatus. 3,917,432, Cl. 415-118.000.

Fiat-Allis Construction Machinery, Inc.: *See—*
Orr, Bobby J., 3,917,013.

Fiat Societa per Azioni: *See—*
Abate-Daga, Giancarlo; and Amato, Ignazio, 3,917,768.
Puleo, Guiseppe, 3,917,332.
Stratta, Adriano; and Bruni, Enrico, 3,917,357.

FIBCO, Incorporated: *See—*
Fitch, John C., 3,916,816.

Fiber Industries, Inc.: *See—*
Ethridge, Fredrick Allen, 3,916,493.

Fiber Materials, Inc.: *See—*
Jahn, Paul F., 3,917,884.

Fida, Takeshi; Nishide, Katsuhiko; Yamanouchi, Teruo; and Kinjo, Kikuo, to Canon Kabushiki Kaisha. Photoconductive polymers of thiocyano-substituted-9-vinylcarbazoles. 3,917,482, Cl. 96-1.500.

Fijitsu Limited: *See—*
Shimizu, Hirotoshi; and Uozumi, Toshiaki, 3,918,055.

Filip, Ioan-Romulus: *See—*
Todereanu, Corneliu; Dimitriu, Iustin-Gheorghe; Filip, Ioan-Romulus; and Ichim, Diona, 3,917,810.

Filsinger, John F.; and Mueller, Roger P., to Texmark, Inc. Automatic sequential textile marking machine. 3,916,783, Cl. 101-21.000.

Fink, Robert, to Inglis Nurseries Inc. Flexible traffic barrier. 3,917,231, Cl. 256-64.000.

Fink, Trevor, to Jarva, Inc. Small diameter horizontal tunneling machine. 3,917,010, Cl. 175-73.000.

Finley, Delbert D. Adjustment means for offset disc. 3,917,004, Cl. 172-328.000.

Finley, Keith W., to General Electric Company. Transformer/transmission line interconnect system. 3,917,985, Cl. 317-103.000.

Finnemore, Fred M., to Polaroid Corporation. Adapter apparatus for a film-handling cassette. 3,917,144, Cl. 226-195.000.

Firestone Tire & Rubber Company, The: *See—*
Allcock, Harry Rex; and Gardner, James Earl, 3,917,802.

Firmenich & Cie: *See—*
Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., 3,917,871.
Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., 3,917,872.

First Foto, Inc.: *See—*
Horn, Donald N.; and Randmae, Rein S., 3,918,075.

Fisher, Bernard M.; Hills, Robert C.; and Touro, Freddie J., to Freeport Minerals Company. Process for the manufacture of electrolytic copper. 3,917,519, Cl. 204-108.000.

Fisher, Colin R.; and Perry, Louis W., Jr., to United States of America, Energy Research & Development Administration. Thermionic nuclear reactor with internal heat distribution and multiple duct cooling. 3,917,509, Cl. 176-39.000.

Fisher, Richard D., to White-Westinghouse Corporation. Refrigerator shelf support assembly. 3,917,206, Cl. 248-239.000.

Fisher, Robert James: *See—*
Hadley, Richard Marshall; and Fisher, Robert James, 3,917,212.

Fisher, Stanton E. Animal litter excrement control system. 3,916,831, Cl. 119-1.000.

Fitch, John C., to FIBCO, Incorporated. Highway marker. 3,916,816, Cl. 116-63.00P.

Fitzpatrick, Joseph William; and Schmidt, Harold Norbert, to Toms River Chemical Corporation. Vat dyestuffs prepared from crude aminoanthraquinone mixtures. 3,917,640, Cl. 260-316.000.

Flament, Ivon: *See—*
Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., 3,917,871.
Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., 3,917,872.

Fleishman, Leonard: *See—*
Lynch, Henry J.; and Fleishman, Leonard, 3,916,635.

Fleming, Thomas Geoffrey Rex: *See—*
Ferrada, Stephen Salvador; Wisdom, Ronald David; and Fleming, Thomas Geoffrey Rex, 3,917,938.

Flichman, Howard John: *See—*
Boggs, Luther Miles; Flichman, Howard John; Hudson, James Alphus, Jr.; and Levengood, Johnny William, 3,916,676.

Flores, Jose A.: *See—*
Gates, Louis E., Jr.; Lent, William E.; and Flores, Jose A., 3,917,773.

Flowerday, Frederick George. Vortex linkages. 3,916,559, Cl. 46-1.00R.

FMC Corporated: *See—*
Looker, Olin L.; Johnson, Robert A.; Scribner, Frank F.; and Slates, Larry L., 3,916,913.

FMC Corporation: *See—*
Freiheit, Frederick E., 3,916,496.

Foge, Helga Helene; and Thomsen, Hans Thomas. Mobile suitcase. 3,917,038, Cl. 190-18.00A.

Ford Motor Company: *See—*
Huff, Alvin E., 3,917,758.
Sawai, Joe Y., 3,917,336.

Forestier, Guy: *See—*
Borgnat, Daniel; Forestier, Guy; and Rupp, Georges, 3,917,243.

Forootan, Iradj; and Foroutan, Manouchehr. Earthquake-proof building structure. 3,916,578, Cl. 52-167.000.

Foroutan, Manouchehr: *See—*
Forootan, Iradj; and Foroutan, Manouchehr, 3,916,578.

Forsberg, Stig Gunnar: *See—*
Backman, Anders Lars Erik; and Forsberg, Stig Gunnar, 3,917,492.

Forster, Robert H.: *See—*
Jones, Bernard M.; Forster, Robert H.; West, Gaylon L.; Quist, Donald G.; and Loyal, Harry C., 3,916,759.

Fort Howard Paper Company: *See—*
Graham, Andrew Stuard, Jr.; and Berg, Coleman David, 3,917,191.

Foseco International Limited: *See—*
Kiguchi, Asahi, 3,917,110.

Fossum, Gust S. Carburetor anti-ice and oil cooling device. 3,916,859, Cl. 123-122.0AA.

Foster, Joe Drahn: *See—*
Ellis, Gary Dale; and Foster, Joe Drahn, 3,916,999.

Foster Wheeler Corporation: *See—*
Ruhe, Anthony; Steel, Robert R.; and Varney, John W., 3,916,990.

Fournie, Rene, to Societe Nationale des Petroles d'Aquitaine. High pressure separator. 3,917,473, Cl. 55-310.000.

Fox, Ronald. Form work for concrete construction. 3,917,215, Cl. 249-23.000.

Frame, Charles W.; and Rickrode, Jack A., to Chambersburg Engineering Company. Hydraulic bearing mounting press. 3,916,499, Cl. 29-208.00C.

Frampton, Orville D., to National Distillers and Chemical Corporation. Olefin hydration using phosphoric acid on porous silica xerogel. 3,917,721, Cl. 260-641.000.

Francis, Robert Hugh, to Hawker-Siddeley Aviation Ltd. Aircraft. 3,917,197, Cl. 244-93.000.

Franco, Nicholas B.: *See—*
Xmris, Pavel; and Franco, Nicholas B., 3,917,470.

Franke, Hans G., to Chevron Research Company. Production of s-ammonium phosphoric acid esters and thiolo-phosphoric acid esters from thiono-phosphoric acid esters. 3,917,755, Cl. 260-987.000.

Frankl, George, to Joseph Lucas (Industries) Limited. Electrically conductive plates providing eddy current damping for an electromagnetic device. 3,918,016, Cl. 335-224.000.

Franks, Charles R.; Schenker, Barry A.; and Kolb, James M., to Diamond Shamrock Corporation. Hypochlorite production. 3,917,518, Cl. 204-95.000.

Franz Morat GmbH: *See—*
Schmidt, Techniker Gerhard; Vinnermann, Antonius; and Bender, Rainer, 3,916,650.

Frech, Kenneth J.; Hoppstock, Frederick H.; and Hutchings, David A., to Goodyear Tire & Rubber Company, The. Oxidative dehydrogenation of 2,3-dimethyl-butenes to 2,3-dimethylbutadiene. 3,917,736, Cl. 260-680.00E.

Freed, Meier E.: *See—*
Potoski, John R.; and Freed, Meier E., 3,917,680.

Freedman, Harold H.: *See—*
Kroposki, Lorraine M.; Yoshimine, Masao; and Freedman, Harold H., 3,917,621.

Freeman, James Albert, to FSW Associates. Differential/ratiometric electromyographic bio-feedback monitor. 3,916,876, Cl. 128-2.10M.

Freeman, Maurice A.: *See—*
Feuerstein, Roger F.; Freeman, Maurice A.; and Spinelli, Leonardo B., 3,917,432.

Freeman, Maurice Frederick, to H.G. East & Company Limited. Autovent field ventilator. 3,916,890, Cl. 128-145.800.

Freeport Minerals Company: *See—*
Fisher, Bernard M.; Hills, Robert C.; and Touro, Freddie J., 3,917,519.

Freiheit, Frederick E., to FMC Corporation. Valve assembly. 3,916,496, Cl. 29-157.10R.

Freytag, Klaus; and Benn, Manfred, to Dragerwerk Aktiengesellschaft. Device for moistenning respiratory air for collecting the condensate. 3,916,891, Cl. 128-192.000.

Friedli, Hans R.: *See—*
Vrieland, G. Edwin; and Friedli, Hans R., 3,917,732.

Friedman, Bernard: *See—*
Small, Samuel N.; Friedman, Bernard; and Kavits, Victor B., 3,917,261.

Frindell, Guy H.: *See—*
Sewell, Clinton J.; Frindell, Guy H.; Campagnuolo, Carl; and Vollbracht, Paul, 3,916,760.

Fritz, Fred W. Impact energy absorbing system for a row of vehicle seats. 3,917,339, Cl. 296-65.00A.

Fromnick, Stephen M.; Jones, Ronald E.; and Mayer, Robert, to Sun Oil Company of Pennsylvania. Tide compensation system. 3,916,811, Cl. 114-125.000.

Fruh, Jakob. Device to be attached to a ski for preventing ski runaway. 3,917,297, Cl. 280-11.13B.

FSW Associates: *See—*
Freeman, James Albert, 3,916,876.

Fuchigami, Yoshio: *See—*
Mizukami, Tetsuo; Akahane, Takeshi; and Fuchigami, Yoshio, 3,917,682

Fuchs, Hans: *See—*
Rix, Albert; Fuchs, Hans; Moritz, Rolf; and Ubben, Ernard, 3,916,716.

Fuhrmann, Robert; Koff, Fred W.; and Pisanchyn, John, to Allied Chemical Corporation. Process for the production of 2-aminocycloalkanone oxime. 3,917,699, Cl. 260-566.00A.

Fuji Photo Film Co., Ltd.: *See—*
Arai, Atsuaki; and Tanaka, Mitsugu, 3,917,653.
Dezawa, Shin-Ichiro; and Kitamoto, Tatsuji, 3,917,716.
Inuiya, Masafumi, 3,917,955.
Noguchi, Masaru, 3,917,379.

Fujie, Kunio: *See—*
Harada, Fumio; Yanagida, Takehiko; Fujie, Kunio; and Futawatari, Hajime, 3,916,989.

Fujii, Haruo: *See—*
Kojima, Motoki; Kamogawa, Nin-ichi; and Fujii, Haruo, 3,916,830.

Fujii, Shigeru: *See—*
Matsumura, Shoichi; Wakabayashi, Hiroshi; Nakagawa, Toru; and Fujii, Shigeru, 3,917,747.

Fujiki, Masaru; Yoshida, Masahiro; and Fukuda, Hiroshi, to Pioneer Audio Corporation. Lock. 3,917,329, Cl. 292-163.000.

Fujimoto, Kyohei: *See—*
Haruki, Hiroshi; Hiroi, Yoshiyasu; and Fujimoto, Kyohei, 3,918,062.

Fujimura, Yoshio: *See—*
Tamura, Yuhei; Shiozuka, Osamu; Iwasaki, Toshihiko; Fujimura, Yoshio; and Abe, Kenzo, 3,917,503.

Fujino, Masahiko: *See—*
Matsuzawa, Tai; Hirai, Shin-ichiro; Fujino, Masahiko; Kobayashi, Shigeru; and Yamazaki, Iwao, 3,917,825.

Fujita, Hisaya; Harada, Kinji; and Tanazawa, Toru, to Yokogawa Electric Works, Ltd. Recording controller. 3,918,066, Cl. 346-17.000.

Fujita, Satoshi: *See—*
Terada, Kimio; Fujita, Satoshi; Kohno, Hiroshige; and Sugiyama, Hiromu, 3,917,859.

Fujitsu Limited: *See—*
Inoue, Yuji, 3,917,987.
Noyori, Yasumasa; and Horiba, Mitsuyoshi, 3,918,058.

Fukazawa, Nobuo: *See—*
Kudamatsu, Akio; Miyamoto, Masao; and Fukazawa, Nobuo, 3,917,616.

Fukuda, Hiromi: *See—*
Iketani, Seijiro; Fukuda, Hiromi; and Shirai, Iwao, 3,917,898.

Fukuda, Hiroshi: *See—*
Fujiki, Masaru; Yoshida, Masahiro; and Fukuda, Hiroshi, 3,917,329.

Fukuzawa, Akira: *See—*
Nakagawa, Ryuichi; Yoshimatsu, Shiro; Fukuzawa, Akira; Sato, Akira; Mitsui, Tatsuro; Ueda, Takuya; and Ozaki, Tsuyoshi, 3,917,896.

Furane Plastics Incorporated: *See—*
Hirosawa, Frank N., 3,917,702.

Furlenmeier, Andre; Lanz, Paul; Vogler, Karl, deceased (by Vogler, Heinrich, Franziska Elizabeth Vogler, Niklaus Edward Vogler, heirs); and Zanetti, Guido, to Hoffmann-La Roche Inc. 6-Acyl derivatives of aminopenicillanic acid. 3,917,584, Cl. 260-239.100.

Furlong, Donn B.; Gobler, Harry W.; and Grotheer, Robert, to Ecodyne Corporation. Concrete cooling tower. 3,917,765, Cl. 261-111.000.

Furnish, Richard P., to Raymond Lee Organization Inc., a part interest. Trunk storing utility trailer for auto. 3,917,316, Cl. 280-460.00R.

Furuno, Hiroshi: *See—*
Shimizu, Ikuo; Furuno, Hiroshi; and Oki, Ryuji, 3,918,004.

Furuta, Tetuziro, to Nissan Motor Company Limited. Vehicle seat and safety harness assembly. 3,917,342, Cl. 297-385.000.

Futawatari, Hajime: *See—*
Harada, Fumio; Yanagida, Takehiko; Fujie, Kunio; and Futawatari, Hajime, 3,916,989.

Fuxe, Kjell, to Nelson Research & Development Co. Method for treating libido disorders. 3,917,841, Cl. 424-267.000.

G. A. Serlachius Oy: *See—*
Turunen, Lasse Juhani, 3,916,769.

G. D. McLeod & Sons, Incorporated: *See—*
McLeod, Gordon D., 3,917,648.

G. D. Searle & Co.: *See—*
Adelstein, Gilbert W., 3,917,615.
Cusic, John W.; and Levon, Ernest F., 3,917,636.
Lucchesi, Oreste J.; and Whiteman, Donald A., 3,917,974.
Mueller, Richard A., 3,917,649.
Robinson, Terrence J., 3,916,898.

G.W. Dahl Company, Inc.: *See—*
Erickson, Linwood P., 3,916,930.

Gaberson, Howard A., to United States of America, Navy. Vibratory locomotion means. 3,916,704, Cl. 74-84.00R.

Gabriel, Lester H.; and Willis, Wilfred Ernest. Altering the properties of concrete by altering the quality or geometry of the intergranular contact of filler materials. 3,917,781, Cl. 264-71.000.

Gadessaud, Robert; and Audry, Claudette, to Compagnie Generale D'Electricite. Process for the preparation of electrodes for an electrochemical generator. 3,917,769, Cl. 264-28.000.

Gaffaney, Stephen D.: *See—*
Henderson, James F.; and Gaffaney, Stephen D., 3,918,073.

Gaffney, Bernard J.; and Larsen, Ronald L., to Conwed Corporation. Extruded tubular net products. 3,917,889, Cl. 428-36.000.

Gagarin, Mikhail Alexeevich: *See—*
Merzhanian, Artemy Arutjunovich; Brusilovsky, Sergei Alexeevich; Sarishvili, Naskid Grigorievich; Kishkovsky, Zbignev Nikolaevich; Bronshtein, Isaal Iosifovich; and Gagarin, Mikhail Alexeevich, 3,916,775.

Gageby, Steven Douglas. Continuous-strand, fiber reinforced plastic wheel. 3,917,352, Cl. 301-63.0PW.

Gaiser, Frederick Luis: *See—*
Walsh, Matthew John; Gaiser, Frederick Luis; and Marcotte, Robert Normand, 3,916,515.

Galantay, Eugene E., to Sandoz, Inc. Amino-substituted benzocycloheptenones for inducing sleep. 3,917,833, Cl. 424-330.000.

Gale, Michael Thomas, to RCA Corporation. Frequency-encoded focussed image hologram record. 3,917,378, Cl. 350-3.500.

Gall, Martin, to Upjohn Company, The. 9-[3-(Dimethylamino)-propylidene]-9H-dibenzo[c,f]-imidazol[1,2-a]azepines. 3,917,633, Cl. 260-309.000.

Galluccio, Vincent P., to Lynch Communication Systems, Inc. Call concentrator with expanded intracall capability. 3,917,908, Cl. 179-18.0FC.

Galluzzi, Giovanni, to Giulio Fiocchi, S.p.A. Self-propelling projectile for firearms. 3,916,793, Cl. 102-38.000.

Garcea, Giampaolo, to Alfa Romeo S.p.A. Instrument for indicating the kilometric fuel consumption of a motor vehicle provided with an injection feed explosion engine. 3,916,682, Cl. 73-114.000.

Garcia, Emilia Miguel. Loading platform. 3,916,803, Cl. 108-51.000.

Gardikes, John J.; and Kim, Young D., to Ashland Oil, Inc. Foundry resins treated with nitro compounds. 3,917,558, Cl. 260-38.000.

Gardiner, David Stirling, to General Foods Limited. Dessert composition. 3,917,875, Cl. 426-573.000.

Gardisette Holding AG: *See—*
Pape, Hermann, 3,917,065.

Gardner-Denver Company: *See—*
Harms, William J.; and Loy, Fred W., 3,916,516.
Heckenkamp, Frederick William; and Wensing, Francis M., 3,917,474.

Gardner, James Earl: *See—*
Allcock, Harry Rex; and Gardner, James Earl, 3,917,802.

Garland Industries, Inc.: *See—*
Lanoie, Louis A., 3,917,418.

Garner, Lloyd L., to Smith International, Inc. Lubrication reservoir assembly. 3,917,028, Cl. 184-6.140.

Garrett, John A.: *See—*
Neville, Richard E. G.; and Garrett, John A., 3,916,915.

Garrison, Leon E. Method of and apparatus for collecting grass cuttings. 3,916,608, Cl. 56-202.000.

Gartner, Joseph R.; and Miller, Harold M. Tunable vibration absorber. 3,917,246, Cl. 267-136.000.

Gass, Edward W.; and Guest, Rebert J., to Halliburton Company. System for nondestructively testing vessels. 3,916,673, Cl. 73-37.000.

Gates, Louis E., Jr.; Lent, William E.; and Flores, Jose A., to United States of America, Navy. Method for fabricating a shaped dielectric antenna lens. 3,917,773, Cl. 264-44.000.

Gates Rubber Company, The: *See—*
Kerst, Al F.; and Douros, John D., Jr., 3,917,476.

Gates, Walter C., Jr.: *See—*
Hudson, Ralph B., Jr.; and Gates, Walter C., Jr., 3,917,706.

Gateway Industries, Inc.: *See—*
Bryll, Medard Z., 3,917,189.

Gautschi, Fritz: *See—*
Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., 3,917,871.
Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., 3,917,872.

Gaylord, John F., Jr., to Medical Specialties, Inc. Adjustable cervical collar. 3,916,885, Cl. 128-75.000.

Gazda, Chester T.; and Lalikos, James M., to Titeflex. Poly-polymer plastic device. 3,916,488, Cl. 24-262.00R.

Gebhard, Albert W., to Gerico, Inc. Foldable canopy for baby carriages. 3,917,302, Cl. 280-36.00B.

Gebr. Agterhof N.V.: *See—*
Agterhof, Henk; and deWaal, Johannes Antony, 3,916,591.

Gebruder Loepfe AG: *See—*
Loepfe, Erich; and Domig, Rene, 3,916,687.

Geffroy, Robert. Assembly comprising a piston groove, a piston ring and an inertia ring sliding in a cylinder. 3,917,290, Cl. 277-75.000.

Geiger, Istvan, to Volkswagenwerk Aktiengesellschaft. Combustion engine having a cylinder comprising a combustion chamber and an ante-chamber. 3,916,840, Cl. 123-32.0ST.

Geis, James D.; and Cofek, Henry R., to Geisco Associates. Optical inspection system. 3,917,414, Cl. 356-200.000.

Geisco Associates: *See—*
Geis, James D.; and Cofek, Henry R., 3,917,414.

Geissler, Ernst: *See—*
Helletsberger, Harald; Ofer, Heinrich; Haidacher, Wilhelm; and Geissler, Ernst, 3,916,580.

General Electric Company: *See—*
Carson, Chester C.; Barton, Sterling C.; and Echeverria, Federico S., 3,916,671.
Elsworth, Robert M., 3,916,964.
Feuerstein, Roger F.; Freeman, Maurice A.; and Spinelli, Leonardo B., 3,917,432.
Finley, Keith W., 3,917,985.
Groves, James N.; and Kaplan, Joel H., 3,917,451.
Horn, F. Hubbard, deceased, 3,917,495.
Klassen, David Dubble; and Brozenske, Donald Alan, 3,916,495.
Mark, Victor, 3,917,559.
Noone, Michael J., 3,916,804.
Nuckolls, Joe A., 3,917,976.
Parker, Rollin James, 3,917,914.
Pekrul, Ronald G.; Stegmaier, Louis T.; and Mrowka, Joseph J., 3,917,920.
Sherman, Ralph R., Jr., 3,917,990.
Takekoshi, Tohru; and Kochanowski, John E., 3,917,643.
Webb, Jimmy L.; Corn, John E.; and Swiger, R. Thomas, 3,917,720.

General Foods Corporation: *See—*
Viera, Paul E.; Benincasa, Anthony; Halladay, Paul D.; and LaTour, Diane J., 3,917,861.

General Foods Limited: *See—*
Gardiner, David Stirling, 3,917,875.

General Mills Chemicals, Inc.: *See—*
Yueh, Mao H., 3,917,816.

General Motors Corporation: *See—*
Bandukwalla, Phiroze, 3,917,434.
Grewette, Richard S.; and Woods, Edward J., 3,917,035.
Hochmann, Eugene; and Breitenstein, Richard C., 3,916,545.
Hoffman, Charles T., Jr.; and Warwick, Edward H., 3,917,032.

Hood, Richard A.; and Raab, Thomas L., 3,916,541.
Johnson, Lawrence P.; and Kitchin, Oscar G., 3,917,036.
Kemp, Stanley William, 3,916,817.
Klomp Edward D., 3,916,845.
Koenig, Richard J., 3,916,934.

General Tire & Rubber Company, The: *See*—
Fabris, Hubert J.; Herold, Robert J.; and Maxey, Edwin M., 3,917,666.

Georg Grammer: *See*—
Daunderer, Heinz; and Meiller, Hermann, 3,917,211.

George, E. Paul; and Lincoln, Robert Nelson, to TRW, Inc. Electrical protector assembly. 3,917,982, Cl. 317-61.500.

Gepfert, Robert K.: *See*—
Swisher, George W., Jr.; Hopkins, Michael F.; and Gepfert, Robert K., 3,917,084.

Gerard, Andre; and Lacombat, Michel, to Thomson-CSF. Interference fringe counting system and method. 3,917,926, Cl. 235-92.0GC.

GerdiKerstholt geb. Spath: *See*—
Kerstholt, Fritz, 3,916,461.

Gerico, Inc.: *See*—
Gebhard, Albert W., 3,917,302.

Gerring, Ernest Edward Lawrence: *See*—
Camble, Roger; Gregory, Harold; and Gerring, Ernest Edward Lawrence, 3,917,824.

Gerry, Martin E. Multihead dilator. 3,916,906, Cl. 128-344.000.

Gerster, John F., to Minnesota Mining and Manufacturing Company. Pyrroloquinoline carboxylic acids and derivatives. 3,917,609, Cl. 260-287.00P.

Gertsch AG: *See*—
Gertsch, Ulrich; and Gertsch, Ernst, 3,917,296.

Gertsch, Ernst: *See*—
Gertsch, Ulrich; and Gertsch, Ernst, 3,917,296.

Gertsch, Ulrich; and Gertsch, Ernst, to Gertsch AG. Holding mechanism for holding a ski boot. 3,917,296, Cl. 280-11.35K.

Gewerkschaft Eisenhutte Westfalia: *See*—
Arsuaga, Javier, 3,916,630.

Ghosh, Suhas; and Ruffatti, Robert, to Wescom, Inc. Method and means for interrogation of digital repeatered lines. 3,917,916, Cl. 179-175.31R.

Giacino, Christopher: *See*—
Slangan, Gary; Pittet, Alan O.; Giacino, Christopher; Hruza, Denis E., Sr.; and Shuster, Edward J., 3,917,870.

Giansante, Joseph A., to Giansante, Joseph A. Pasteurization atmosphere control system. 3,916,987, Cl. 165-16.000.

Gibbs, Dale S.; Simons, Paul B.; Vandell, Robert D.; and Wessling, Ritchie A., to Dow Chemical Company, The. Process for preparing substantially linear water-soluble or water-dispersible interpolymeric interfacially spreading polyelectrolytes. 3,917,574, Cl. 260-79.3MU.

Gibson, Roy: *See*—
Morser, Alfred Harold; Gibson, Roy; Scott, Stephen Anthony; Bailey, Clifford Michael; and Taylor, Ian Keith, 3,918,045.

Gieterij Doesburg B.V.: *See*—
Agterhof, Henk; and deWaal, Johannes Antony, 3,916,591.

Gilbert, Jeffrey F.: *See*—
Clarke, E. Colin W.; Gilbert, Jeffrey F.; and Glew, David N., 3,917,521.

Gillard, Clarence. Locktop fire hydrant. 3,916,939, Cl. 137-296.000.

Gilligan, Marjorie Crocker; and Le Porte, Robert C. Device for improving a childs manual dexterity and finger coordination. 3,916,537, Cl. 35-29.00E.

Gilliland, Barbara Faye: *See*—
Breyer, Walter Herman; Edelson, Nathan Allen; Gilliland, Barbara Faye; and Schatz, Clarence Henry, 3,916,900.

Gilmore, Guy T., to Multi-Fab, Inc. Pipe cutting machine. 3,916,519, Cl. 30-97.000.

Gilmore, Samuel E. Valve. 3,917,220, Cl. 251-86.000.

Gingerich, Leo L.: *See*—
Jurrens, Lawrence D.; and Gingerich, Leo L., 3,917,551.

Giordano, Jacqueline. Hair curler. 3,916,919, Cl. 132-40.000.

Giraud, Yves, to Laurent Bouillet, S.A. Installation and method for heat treatment of refuse and/or similar products. 3,916,806, Cl. 110-14.000.

Girdwood, James: *See*—
Brown, Rollen E.; and Girdwood, James, 3,917,067.

Girling Limited: *See*—
Rath, Heinrich Bernard; and Klassen, Horst Willi, 3,917,033.

Giulio Fiocchi, S.p.A.: *See*—
Galluzzi, Giovanni, 3,916,793.

Givaudan Corporation: *See*—
Ochsner, Paul Albert, 3,917,675.

Givaudon Corporation: *See*—
Ploner, Klaus-Jurgen, 3,917,735.

Glancy, Charles William; and Bryant, George Macon, to Union Carbide Corporation. Solid glyoxal-urea products. 3,917,659, Cl. 260-555.00R.

Glanvall, Rune, to Stal Refrigeration AB. Rotary compressor of the sliding vane type. 3,917,438, Cl. 418-150.000.

Glaser, Karl: *See*—
Neubrand, Paul; Glaser, Karl; Prater, Martin; and Schmid, Siegfried, 3,916,738.

Glaxo Laboratories Limited: *See*—
Pearce, Derek Roger; Davis, Benjamin; Pearce, Derek Roger; and Connor, Paul, 3,917,830.

Glew, David N.: *See*—
Clarke, E. Colin W.; Gilbert, Jeffrey F.; and Glew, David N., 3,917,521.

Glory Kogyo Kabushiki Kaisna: *See*—
Yorisue, Kazumi; and Akamatsu, Mitsuhiro, 3,917,046.

Glueck, Alan R.: *See*—
Reed, Richard S.; and Glueck, Alan R., 3,917,797.

Gobler, Harry W.: *See*—
Furlong, Donn B.; Gobler, Harry W.; and Grotheer, Robert, 3,917,765.

Godbersen, Byron L. Boat supporting apparatus. 3,917,087, Cl. 214-84.000.

Godtfredsen, Wagn Ole, to Lovens kemiske Fabrik Produktionsaktieselskab. Cephalosporanic acid esters. 3,917,590, Cl. 260-243.00C.

Gohring, Werner. Oven apparatus. 3,917,238, Cl. 266-5.00E.

Gold, Elijah H., to Schering Corporation. Compositions and methods for treating parkinsonism. 3,917,840, Cl. 424-267.000.

Gold Kist Inc.: *See*—
Ayres, James L.; Peterson, Jeffery D.; and Steele, Robert C., 3,917,860.

Goldberg, Jack M. Serum lipase method and medium. 3,917,515, Cl. 195-103.50R.

Goldman, Irving M.: *See*—
Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., 3,917,871.
Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., 3,917,872.

Goldman, Leon: *See*—
Lin, Yang-I; and Goldman, Leon, 3,917,837.

Goldstein, Sanders: *See*—
Smolin, Michael; and Goldstein, Sanders, 3,916,926.

Good, Milton W. Combination golf cart and seat. 3,917,303, Cl. 280-36.00C.

Gooding, Elwyn R. Chin cup and chin strap for protective headgear. 3,916,446, Cl. 2-3.00R.

Goodman, Walter P.: *See*—
Bullock, Norman J.; Wendt, Frank W.; and DePas, Laddie A., 3,916,546.

Goodyear Tire & Rubber Company, The: *See*—
Auerbach, Melvin; and Pierson, Robert M., 3,916,969.
Auerbach, Melvin, 3,917,700.
Frech, Kenneth J.; Hoppstock, Frederick H.; and Hutchings, David A., 3,917,736.
Hess, LLoyd D.; and Mast, William C., 3,917,749.

Gordon, Ronnie D., to Continental Oil Company. Purification of vinyl chloride. 3,917,728, Cl. 260-656.00R.

Goritsky, Boris Sergeevich: *See*—
Ivanov, Viktor Vasilievich; and Goritsky, Boris Sergeevich, 3,917,289.

Gorman, Lee A.; and Romer, Thomas R., to Ralston Purina Company. Chromatographic column scanning apparatus. 3,917,413, Cl. 356-197.000.

Gospodar, Reinhard, to Volkswagenwerk Aktiengesellschaft. Combustion engine with at least one exhaust gas cleaning arrangement. 3,916,622, Cl. 60-277.000.

Gosselin, Paul: *See*—
Dorofachuk, Gus; and Gosselin, Paul, 3,917,158.

Gosteli, Jacques, to Ciba-Geigy Corporation. Methyl(9-methyl-acaidan-9-yl)-ketones. 3,917,603, Cl. 260-279.00R.

Gothard, John Floyd, Jr.; Dodd, Richard Edward; and Peterson, William Carl, to Celesco Industries Inc. Radio controlled surface target. 3,917,270, Cl. 273-105.200.

Goto, Mitsuhiro, to Kabushiki Kaisha Suwa Seikosha. Charge Calculator. 3,917,934, Cl. 235-156.000.

Gotz, Manfred K.: *See*—
Immer, Hans U.; Sestanj, Kazimir; Nelson, Verner R.; and Gotz, Manfred K., 3,917,578.
Immer, Hans U.; Sestanj, Kazimir; Nelson, Verner R.; and Gotz, Manfred K., 3,917,581.

Gouvenel, Daniel Christian: *See*—
DeGois, Michel Louis; and Gouvenel, Daniel Christian, 3,916,979.

Grable, Donovan B., to Wasteland Reclamation Corporation. Induced recovery of particles from sub-surface formations. 3,917,326, Cl. 299-8.000.

Grace, Henry A.; and Conrad, Robert G. Golf putting training device. 3,917,280, Cl. 273-183.00R.

Gradeff, Peter S.; and Bertrand, Claude, to Rhodia, Inc. Process for preparing hydroxy citronellal. 3,917,713, Cl. 260-602.000.

Graf, Arthur; and Graf, Richard A. Stapling machine particularly adapted for use in limited clearance applications. 3,917,145, Cl. 227-90.000.

Graf, Carl R., to Pennsylvania Crusher Corporation. Shredder hammer. 3,917,179, Cl. 241-194.000.

Graf, Richard A.: *See*—
Graf, Arthur; and Graf, Richard A., 3,917,145.

Graham, Andrew Stuard, Jr.; and Berg, Coleman David, to Fort Howard Paper Company. Paper towel dispenser and transfer mechanism. 3,917,191, Cl. 242-55.300.

Grands Moulins De Paris: *See*—
Suva, Tito R.; and Schmidt, Hans-Peter, 3,917,445.

Grant, Clyde P.; Look, Merton A.; and Lowe, Richard M., to Scott Paper Company. Perforate development electrode. 3,916,827, Cl. 118-637.000.

Grattan, Donald J. Sanitary scoop. 3,917,333, Cl. 294-1.00R.

Graves, Gail W.: *See*—
Hester, Clarence H.; Petrosky, Willard L.; Stewart, Joseph T., Jr.; Murphree, Burleigh R.; and Graves, Gail W., 3,916,943.

Gray, Roy M. Hanging candle structure. 3,917,441, Cl. 431-292.000.

Greaves, Roland E. Mixing bowl lift truck. 3,917,093, Cl. 214-313.000.
Green Barg, Nathan M., to Diego, Joseph, a part interest. Chance ticket. 3,917,276, Cl. 273-139.000.
Greenfield, Charles; Casparian, Robert E.; and Bonanno, Anthony J., to Hanover Research Corporation. Process and apparatus for recovering clean water and solids from dilute aqueous solids. 3,917,508, Cl. 159-47.00R.
Greenshields Inventions Limited: *See—*
Greenshields, Roderick Norman, 3,917,853.
Greenshields, Roderick Norman, to Greenshields Inventions Limited. Production of extracts from cells. 3,917,853, Cl. 426-60.000.
Gregoire, Marc, to Elast-O-Flex, Inc. Snowmobile track. 3,917,360, Cl. 305-30.000.
Gregor, Vaughn. Distributor with discharge conveyors. 3,917,050, Cl. 198-37.000.
Gregory, Harold: *See—*
Camble, Roger; Gregory, Harold; and Gerring, Ernest Edward Lawrence, 3,917,824.
Grenfell, Julian Pascoe, to Sale Tilney AG. Adhesive block. 3,917,123, Cl. 222-146.0HE.
Grethe, Guenter; and Uskokovic, Milan Radoje, to Hoffmann-La Roche Inc. 1,1-Dichloro-3-(4-piperidinyl)propan-2-ols. 3,917,612, Cl. 260-293.900.
Grewette, Richard S.; and Woods, Edward J., to General Motors Corporation. Electric brake adjuster. 3,917,035, Cl. 188-161.000.
Grigsby-Barton, Inc.: *See—*
Pascente, Joseph E., 3,917,962.
Griscom, Richard William, to Syntex (U.S.A.) Inc. Preparation of ethers of a phenol and an alkyl polyol. 3,917,717, Cl. 260-613.00D.
Grobe, Donald F., to Square D Company. Treadle operated control. 3,916,722, Cl. 74-512.000.
Gross, Frank C., to Scott Paper Company. Apparatus for developing an electrostatic latent image on an electrophotographic film. 3,916,828, Cl. 118-637.000.
Grosse-Allermann, Wilfried, to Babcock & Wilcox, Limited. Expansion joint. 3,917,320, Cl. 285-114.000.
Grosse, Maurice. Newspaper vending machine. 3,917,114, Cl. 221-251.000.
Grotheer, Robert: *See—*
Furlong, Donn B.; Gobler, Harry W.; and Grotheer, Robert, 3,917,765.
Grout, Kenneth M.; and Devellian, Richard D., to Kenics Corporation. Interactive surface mixer. 3,917,811, Cl. 423-659.000.
Groves, James N.; and Kaplan, Joel H., to General Electric Company. Electrokinetic streaming current detection. 3,917,451, Cl. 23-230.00B.
GRUNDIG E.M.V. Elektro-Mechanische Versuchsanstalt Max Grundig: *See—*
Beuter, Rudolf; Reissmann, Walter; and Cesal, Rudolf, 3,918,040.
Grunwald, Frederick A., to Mead Johnson & Company. Arylsulfonylcarbamoyl-1,3-dicarbonylalicyclic. 3,917,692, Cl. 260-556.0AR.
Grunwell, Joyce F.; Benson, Harvey D.; and Petrow, Vladimir, to Richardson-Merrell Inc. 3-Keto-7 α,β-loweralkyl-Δ 5-steroids. 3,917,831, Cl. 424-243.000.
Grupul Industrial de Chimie: *See—*
Todereanu, Corneliu; Dimitriu, Iustin-Gheorghe; Filip, Ioan-Romulus; and Ichim, Diona, 3,917,810.
GTE Automatic Electric Laboratories Incorporated: *See—*
Macrander, Max S.; and Kowalik, Ronald F., 3,917,904.
Macrander, Max S.; and Kowalk, Ronald F., 3,917,909.
Sheahan, Desmond F.; and Callander, George C., 3,916,490.
GTE Sylvania Incorporated: *See—*
Carlisle, Neil K.; and Pettee, James L., 3,916,967.
Muzeroll, Martin E., 3,917,971.
Guarderas, Fernando V., to Data Products Corporation. Paper motion sensor apparatus. 3,917,142, Cl. 226-38.000.
Guest, Robert J.: *See—*
Gass, Edward W.; and Guest, Robert J., 3,916,673.
Gundersen Clinic, Ltd.: *See—*
Boge, Raymond J., 3,917,954.
Gundlach, Robert W.: *See—*
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Gusdorf & Sons, Inc.: *See—*
Gusdorf, Walter; and Smith, Walter E., 3,917,368.
Gusdorf, Walter; and Smith, Walter E., to Gusdorf & Sons, Inc. Pedestal stand column assembly. 3,917,368, Cl. 312-254.000.
Guse, Rudolf: *See—*
Paknke, Hans Joachim; and Guse, Rudolf, 3,916,667.
Gustincic, Jacob Joseph, to Cubic Corporation. Wide angle antenna system. 3,918,064, Cl. 343-783.000.
Guth, Gerard: *See—*
Humbert, Francoise Ernestine Lucie; and Guth, Gerard, 3,917,613.
Guthlein, Werner: *See—*
Rittersdorf, Walter; Guthlein, Werner; Rey, Hans-Georg; and Rieckmann, Peter, 3,917,452.
Gutjahr, Paul; and Luthi, Hans, to Erapa AG. Tape-clamping device. 3,916,779, Cl. 100-26.000.
Gutleber, Frank S. Multiplexed pseudo noie pulse burst codes with space taper. 3,917,999, Cl. 325-40.000.
Guzzetta, Joseph A.: *See—*
Pearne, Frank S.; Pearne, Florentin J.; Osborn, William P.; King, Terance M.; and Guzzetta, Joseph A., 3,917,081.
H.A.S. Investments, Inc. (Entire): *See—*
Williams, Zelmer L., 3,916,473.
H.G. East & Company Limited: *See—*
Freeman, Maurice Frederick, 3,916,890.
H. H. Robertson Company: *See—*
Vare, Bobby G., 3,916,577.
H. Koch & Sons, Inc.: *See—*
Poehlmann, Paul W., 3,917,213.
H & T Industries: *See—*
Tingey, Bruce K.; and Howcroft, Robert Kent, 3,917,268.
Habermeier, Jurgen: *See—*
Porret, Daniel; and Habermeier, Jurgen, 3,917,637.
Hack, J. Roy. Emergency gas tank apparatus. 3,916,938, Cl. 137-256.000.
Hackenberg, Hubert; and Zobel, Siegfried, to Agfa-Gevaert AG. Film transporting mechanism for still cameras. 3,918,074, Cl. 354-213.000.
Hadley, Richard Marshall; and Fisher, Robert James, to Harman International Industries, Inc. Cross arm mirror mount for remote control rearview mirrors. 3,917,212, Cl. 248-487.000.
Haemonetics Corporation: *See—*
Latham, Allen, Jr., 3,916,892.
Haff, William B. Adjustable harness for ski boot. 3,917,298, Cl. 280-11.13W.
Haffner, Donald G.: *See—*
Akgulian, Sahag C.; and Haffner, Donald G., 3,916,849.
Hagino, Hiroshi: *See—*
Nakayama, Kiyoshi; and Hagino, Hiroshi, 3,917,511.
Haidacher, Wilhelm: *See—*
Helletsberger, Harald; Ofer, Heinrich; Haidacher, Wilhelm; and Geissler, Ernst, 3,916,580.
Hakanson, Alton L.; and Schafer, Wilbur C. System for pre-lubricating an occasionally used, fluid cranked, quick starting, fuel burning engine. 3,917,027, Cl. 184-6.300.
Hakodate Seimo Sengu Kabushiki Kaisha: *See—*
Miyamoto, Hiroshi; Kogima, Miyoshi; and Hashimoto, Sadao, 3,916,809.
Hale, Autho: *See—*
Swisher, George W., Jr.; and Hale, Autho, 3,916,544.
Hall, Thomas E.; and Hansen, Wallace A., to Essex International, Inc. Connector assembly and receptacle terminal therefor. 3,917,377, Cl. 339-192.0RL.
Hall, Thomas R. Audio load indicator. 3,918,037, Cl. 340-267.00C.
Halladay, Paul D.: *See—*
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Halliburton Company: *See—*
Gass, Edward W.; and Guest, Robert J., 3,916,673.
Halloran, John B., to United Merchants and Manufacturers, Inc. Pattern embossing of flocked fabric. 3,916,823, Cl. 118-63.000.
Halpern, Richard L.; and Skiles, Carl L. Water gate. 3,916,628, Cl. 61-28.000.
Hambock, Heinz; Sturm, Elmar; and Weiss, Anton Georg, to Ciba-Geigy Corporation. Heterocyclic compounds. 3,917,630, Cl. 260-302.0SD.
Hamel, John S. Protective glove. 3,916,448, Cl. 2-161.00R.
Hammann, Ingeborg: *See—*
Hoffman, Hellmut; Behrenz, Wolfgang; and Hammann, Ingeborg, 3,917,751.
Sirrenberg, Wilhelm; Homeyer, Bernard; Hammann, Ingeborg; and Stendel, Wilhelm, 3,917,754.
Hammond, Michael Douglas: *See—*
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Hanaway, Richard W.: *See—*
Wagner, Peter B.; Telford, James W.; and Hanaway, Richard W., 3,917,996.
Hancart, Jules Octave; and Tyou, Philippe Alexandre, to Centre de Recherches Metallurgiques — Centrum Voor Research in de Metallurgie. Devices for carrying out a measuring, sampling, or treating operation upon a bath of molten metal. 3,916,693, Cl. 73-423.00R.
Hancock, William L., to Hoover Ball and Bearing Company. Spring fabricating machine and method. 3,916,665, Cl. 72-306.000.
Hanks, Howard, Jr.: *See—*
Hildebrandt, Robert W.; and Hanks, Howard, Jr., 3,917,166.
Hildebrandt, Robert W.; and Hanks, Howard, Jr., 3,917,174.
Hanley, Ronald: *See—*
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Hanna Mining Company, The: *See—*
McGauley, Patrick John; and Dor, Abraham A., 3,917,800.
Hanover Research Corporation: *See—*
Greenfield, Charles; Casparian, Robert E.; and Bonanno, Anthony J., 3,917,508.
Hanselman, Paul N.: *See—*
Lambert, Gray; and Hanselman, Paul N., 3,917,105.
Hansen, Harry, to Opti-Holding AG. Method of making a slide-fastener coupling element. 3,917,787, Cl. 264-146.000.
Hansen, Wallace A.: *See—*
Hall, Thomas E.; and Hansen, Wallace A., 3,917,377.
Hanson, Chris A.: *See—*
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Hanson Industries Inc.: *See—*
Swan, Jack C., Jr.; Bertetto, Donald W.; and Hanson, Chris A., 3,917,122.
Hanson, Raymond A. Concrete mixing plant. 3,917,236, Cl. 259-154.000.
Hanson, Violet M. Method of making a flat bottom bag. 3,916,770, Cl. 93-35.0SB.

Hanze, Arthur R., deceased: *See—*
Hester, Jackson B., Jr.; and Hanze, Arthur R., deceased, 3,917,627.

Hanze, Janice W., administratrix: *See—*
Hester, Jackson B., Jr.; and Hanze, Arthur R., deceased, 3,917,627.

Harada, Fumio; Yanagida, Takehiko; Fujie, Kunio; and Futawatari, Hajime, to Hitachi, Ltd. Heat exchanger. 3,916,989, Cl. 165-151.000.

Harada, Kinji: *See—*
Fujita, Hisaya; Harada, Kinji; and Tanazawa, Toru, 3,918,066.

Harder, Donald C.; and Rana, Victoriano F., to Harris-Intertype Corporation. Method and apparatus for producing magazines or the like. 3,917,252, Cl. 270-58.000.

Hargreaves, Thomas Walter, to Davy-Loewy Limited. Rolling mills. 3,916,661, Cl. 72-31.000.

Harlan, James T., Jr., to Shell Oil Company. Hydroxylated and chlorinated block copolymer blends. 3,917,742, Cl. 260-859.00R.

Harlan, James T., Jr.: *See—*
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Harman International Industries, Inc.: *See—*
Hadley, Richard Marshall; and Fisher, Robert James, 3,917,212.

Harmony Emitter Company, Inc.: *See—*
Harmony, Richard C., 3,917,169.

Harmony, Richard C., to Harmony Emitter Company, Inc. Emitter for irrigation systems. 3,917,169, Cl. 239-107.000.

Harms, William J.; and Loy, Fred W., to Gardner-Denver Company. Electrical connector and method for making an electrical circuit. 3,916,516, Cl. 29-628.000.

Harper, John S.; Lean, Eric G.; Spiller, Eberhard A.; and Wilczynski, Janusz S., to International Business Machines Corporation. High resolution lenses for optical waveguides. 3,917,384, Cl. 350-96.0WG.

Harrington, Charles L., to Stauffer Chemical Company. Process for the suspension polymerization of polyvinyl chloride. 3,917,548, Cl. 260-17.00A.

Harris-Intertype Corporation: *See—*
Harder, Donald C.; and Rana, Victoriano F., 3,917,252.

Harris, Stephen C.; Damon, John F.; and Massey, Roger L., to Joan Fabrics Corporation. Needle loom for weaving plush fabric. 3,916,956, Cl. 139-21.000.

Harsanyi, Kalman: *See—*
Takacs, Kalman; Szekeres, Laszlo; Harsanyi, Kalman; Papp, Gyula; Neszmelyi, Andras; and Benedek, Eva, 3,917,610.

Hart, David D. Device for repairing snagged knitwear fabrics. 3,916,645, Cl. 66-1.00R.

Hartel, Kurt: *See—*
Horlein, Gerhard; Mildenberger, Hilmar; Kroniger, Arno; Hartel, Kurt; Duwel, Dieter; and Kirsch, Reinhard, 3,917,635.

Hartgerink, Ronald L.: *See—*
Baird, William C., Jr.; Hartgerink, Ronald L.; and Surridge, John H., 3,917,670.

Hartmann, Charles Harold; and DeLew, Richard Brandt, to Varian Associates. Flame photometric detector employing premixed hydrogen and oxygen gases for sample combustion with end-on spectrophotometer viewing of the flame. 3,917,405, Cl. 356-87.000.

Harty, M. Fillmore, to Dow Chemical Company, The. Sofa bed and mechanism therefor. 3,916,460, Cl. 5-13.000.

Haruki, Hiroshi; Hiroi, Yoshiyasu; and Fujimoto, Kyohei, to Matsushita Electric Industrial Co., Ltd. Receiving loop antenna system. 3,918,062, Cl. 343-702.000.

Harwood, Charles C.; and Quass, Donald W., to Quaker Oats Company, The. Process for production of a simulated meat product. 3,917,876, Cl. 426-585.000.

Hasegawa, Shin; Brewster, Linda C.; and Maier, Vincent P., to United States of America, Agriculture. Limonoate:NAD (P) oxidoreductase. 3,917,512, Cl. 195-62.000.

Hashimoto, Sadao: *See—*
Miyamoto, Hiroshi; Kogima, Miyoshi; and Hashimoto, Sadao, 3,916,809.

Hashimoto, Tohru; Kawarada, Akira; and Tamura, Sachiko, to Rikagaku Kenkyusho. Plant growth modifier and a process for preparation thereof. 3,917,477, Cl. 71-76.000.

Hashimoto, Yoshiyuki: *See—*
Mimura, Akio; Wada, Masahiko; Hashimoto, Yoshiyuki; Tsuzuki, Katsuaki; Iguchi, Takashi; Kawamura, Takeshi; and Arima, Kei, 3,917,514.

Hashimoto, Yukio: *See—*
Morokawa, Shigeru; and Hashimoto, Yukio, 3,916,612.

Hazeldine, Robert Neville; and Rowland, Ronald, to Pennwalt Corporation. Process for insertion of hexafluoropropene at the aliphatic carbon-hydrogen bond of a hydrocarbon. 3,917,725, Cl. 260-653.10R.

Hatsukano, Yoshikazu, to Hitachi, Ltd. Misfet (Metal -insulator-semiconductor field-effect transistor) logical circuit having depletion type load transistor. 3,917,958, Cl. 307-205.000.

Hauser, Whitney J. R.: *See—*
Ferrucci, Lorenzo A.; and Hauser, Whitney J. R., 3,917,501.

Havard, Jean; Charonnat, Henri; and Cova, Francois. Control device for hoisting machines. 3,917,074, Cl. 212-47.000.

Hawker-Siddeley Aviation Ltd.: *See—*
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Hawker Siddeley Dynamics Limited: *See—*
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Hawkins, James B.: *See—*
Van Doorn, Donald W.; Colquett, Jack L.; Hawkins, James B.; Pease, William C., III; and Webb, Tommy W., 3,916,778.

Hawkins, Royal R., to Honeywell Inc. Vehicle steering control. 3,917,015, Cl. 180-6.480.

Hawley, Lee E., to Hanley, Ronald; Enkkeli, Melvin; Clark, Daniel M.; and Bryden, William. Joint structure. 3,916,596, Cl. 52-758.00F.

Hawthorne, Marion Frederick: *See—*
Baldwin, Roger Allen; Hawthorne, Marion Frederick; and Cheng, Ming Tzu, 3,917,719.

Hawtree, George; and Hoyle, Edgar, to Bowden Controls Limited. Transmission mechanisms. 3,916,723, Cl. 74-501.00R.

Hayashi, Katsuhiki: *See—*
Sema, Shunzo; and Sakurada, Ikuo, 3,917,945.

Hayatsu, Eizo: *See—*
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Heath Company: *See—*
Olson, John Emery, 3,917,902.

Hebert, Remy: *See—*
Morival, Genevieve; and Hebert, Remy, 3,917,549.

Heckenkamp, Frederick William; and Wensing, Francis M., to Gardner-Denver Company. Receiver-separator unit for liquid injected gas compressor. 3,917,474, Cl. 55-332.000.

HED Corporation: *See—*
Wohlwend, Donald M.; and Wohlwend, Maurice, 3,917,426.

Hedges, Kenneth B.; and Belford, William R. Insecticidal composition and method of preparing the same. 3,917,814, Cl. 424-23.000.

Hedges, Melvin R., to Cam Industries, Inc. Aerial platform utility enclosure assembly. 3,917,026, Cl. 182-129.000.

Hedgewick, Peter, to Reflex Corporation of Canada Limited. Safety package. 3,917,096, Cl. 215-211.000.

Hegel, Robert W.; and West, Burke A., to Monroe Auto Equipment Company. Vehicle leveling system. 3,917,309, Cl. 280-124.00F.

Heide, Horst, to Audi NSU Auto Union Aktiengesellschaft. Device for control of processes that depend on engine temperature in an automotive internal combustion powerplant. 3,916,623, Cl. 60-288.000.

Heidenreich, William C.: *See—*
Davidson, Samuel L.; Heidenreich, William C.; and Hunter, Phillip, 3,916,466.

Heine, Helmut A., to Propper Manufacturing Co., Inc.; and Optoechnik Heine KG. Illuminated tongue depressor. 3,916,881, Cl. 128-16.000.

Heinsohn, Howard H., Jr.: *See—*
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Heintz, Herman, to Massey-Ferguson Inc. Single lever gear shift control. 3,916,717, Cl. 74-473.00R.

Heinz, David M.; and Stearns, Frederick S., to Rockwell International Corporation. Apparatus and method for dispensing materials into a melt composition. 3,917,125, Cl. 222-189.000.

Heiser, Warren R. Can crusher. 3,916,780, Cl. 100-49.000.

Heisler, Raymond A. Method for molding a plastic container having a molded handle pivotally retained by an integrally formed attachment. 3,917,789, Cl. 264-219.000.

Heiss, Louis Robert, to Baxter Laboratories, Inc. Fluorometer assembly including a flow cell. 3,917,404, Cl. 356-85.000.

Hellberg, Rainer: *See—*
Fauser, Edwin; Schirmer, Gunter; Steinke, Leo; and Hellberg, Rainer, 3,916,855.

Helletsberger, Harald; Ofer, Heinrich; Haidacher, Wilhelm; and Geissler, Ernst, to Tyrolit-Schleifmittelwerke Swarovski K.G. Flat grinding disc. 3,916,580, Cl. 51-209.00R.

Henderson, James F.; and Gaffaney, Stephen D. Golf teaching aid apparatus. 3,918,073, Cl. 354-120.000.

Henderson, William F., to Uniroyal, Inc. Combination lifting and bracing rods for rolls. 3,916,801, Cl. 105-486.000.

Hendrick, Fred W., to Robertshaw Controls Company. Pressure operated flow control device. 3,917,219, Cl. 251-45.000.

Henkel & Cie GmbH: *See—*
Clas, Wilhelm; and Horstkorte, Helmut, 3,917,550.

Henry, Cyrus Pershing, Jr., to Du Pont de Nemours, E. I., and Company. Compositions of olefin-sulfur dioxide copolymers and polyamines as antistatic additives for hydrocarbon fuels. 3,917,466, Cl. 44-62.000.

Herbrandson, Dale. Carburetor and method of carburation. 3,917,762, Cl. 261-62.000.

Herbruggen, Henry J.: *See—*
Miller, Leon F.; Herbruggen, Henry J.; and Shields, Robert G., 3,916,976.

Hercules Incorporated: *See—*
Breslow, David S., 3,917,698.

Herion-Werke KB: *See—*
Motzer, Helmut, 3,916,946.

Hermann Berstorff Maschinenbau GmbH: *See—*
Sander, Gottfried, 3,917,237.

Herold, Robert J.: *See—*
Fabris, Hubert J.; Herold, Robert J.; and Maxey, Edwin M., 3,917,666.

Herold, Robert R., to Thomas Conveyor Company, Inc. Method of selectively distributing bulk material. 3,917,091, Cl. 214-152.000.

Herr, Charles H., to Caterpillar Tractor Company. Modular power transmission with self-energizing device. 3,916,729, Cl. 74-751.000.

Herring, Lloyd D.: *See—*
Okkonen, Oliver G.; and Herring, Lloyd D., 3,917,260.

Herrmann, Guenter: *See—*
Kuessner, Albrecht; and Herrmann, Guenter, 3,917,708.

Hesch, Harold E.: *See*—
Hutchison, John W.; and Hesch, Harold E., 3,916,800.

Hess, LLoyd D.; and Mast, William C., to Goodyear Tire & Rubber Company, The. Resinous butadiene/styrene reinforcing copolymers. 3,917,749, Cl. 260-880.00R.

Hesse, Robert Henry: *See*—
Barton, Derek Harold Richard; and Hesse, Robert Henry, 3,917,688.

Hessler, Willi: *See*—
Bischoff, Edelbert; and Hessler, Willi, 3,917,552.

Hester, Clarence H.; Petrosky, Willard L.; Stewart, Joseph T., Jr.; Murphree, Burleigh R.; and Graves, Gail W., to John L. Dore' Co. Plastic lined plug valve. 3,916,943, Cl. 137-375.000.

Hester, Jackson B., Jr.; and Hanze, Arthur R., deceased (by Hanze, Janice W., administratrix), to Upjohn Company, The. 6-Substituted 4H-imidazo[1,2-a][1,4]benzodiazepines and process for their production. 3,917,627, Cl. 260-296.00T.

Hester, John W. Hole-opener tool. 3,917,011, Cl. 175-339.000.

Heubeck, Erich; and Behne, Ernst-August, to Siemens Aktiengesellschaft. Movable working chair, particularly for dentists. 3,917,203, Cl. 248-158.000.

Hewes, Francis W., Jr. Stock dipping apparatus. 3,916,839, Cl. 119-158.000.

Hewlett-Packard GmbH: *See*—
Courtin, Erich; and Traub, Stefan, 3,916,878.

Hewson, Carl, to Brunswick Manufacturing Co., Inc. Neck assembly for mannequin. 3,916,535, Cl. 35-17.000.

Heyden, Rudi: *See*—
Worschech, Kurt; Heyden, Rudi; Wolf, Kurt; Jaeckel, Manfred; and Eckelt, Michael, 3,917,555.

Hickman, Ronald Price, to Inventec International Limited. Drill guides. 3,917,427, Cl. 408-72.000.

Higgins, Larry, to Leggett & Platt, Incorporated. Metal slat box spring assembly. 3,916,463, Cl. 5-264.00R.

Higuchi, Takeru: *See*—
Theeuwes, Felix; and Higuchi, Takeru, 3,916,899.

Hildebrandt, Robert W.; and Hanks, Howard, Jr., to Andco Incorporated. Drip irrigation method. 3,917,166, Cl. 239-1.000.

Hildebrandt, Robert W.; and Hanks, Howard, Jr., to Andco Incorporated. Drip irrigation system. 3,917,174, Cl. 239-542.000.

Hildebrandt, Ullrich, to Linde Aktiengesellschaft. Low temperature cable system and method for cooling same. 3,917,897, Cl. 174-15.00C.

Hilfman, Lee, to Universal Oil Products Company. Combination process for the conversion of heavy distillates to LPG. 3,917,562, Cl. 208-59.000.

Hill, Ada S.: *See*—
Roelofs, Wendell L.; Hill, Ada S.; Baker, Thomas C.; and Carde, Ring T., 3,917,711.

Hills, Robert C.: *See*—
Fisher, Bernard M.; Hills, Robert C.; and Touro, Freddie J., 3,917,519.

Hilton, John Leslie, to Plessey Company Limited, The. Automatic control of ram-type fluid-pressure operated actuator units. 3,916,765, Cl. 91-307.000.

Himsl, Ernst G., to Massey-Ferguson Industries Limited. Support and mounting. 3,917,204, Cl. 248-188.000.

Hindman, William S.: *See*—
West, Thomas B.; King, Ernest V.; and Hindman, William S., 3,916,653.

Hino, Naganori: *See*—
Satomi, Takeo; Hino, Naganori; Yoshida, Ryo; and Mukai, Kunio, 3,917,753.

Hirai, Shin-ichiro: *See*—
Matsuzawa, Tai; Hirai, Shin-ichiro; Fujino, Masahiko; Kobayashi, Shigeru; and Yamazaki, Iwao, 3,917,825.

Hiroi, Yoshiyasu: *See*—
Haruki, Hiroshi; Hiroi, Yoshiyasu; and Fujimoto, Kyohei, 3,918,062.

Hirokawa, Kazuaki; and Anbo, Tsugio, to Shinagawa Automotive Electric Wire Co., Ltd. Electrical connecting apparatus. 3,917,371, Cl. 339-19.000.

Hirosawa, Frank N., to Furane Plastics Incorporated. Method for making liquid resinous curing agents for epoxy resins and the products thereof. 3,917,702, Cl. 260-570.00D.

Hirsch, Arnold J. Swaged metal dental crowns. 3,916,525, Cl. 32-12.000.

Hirschenhofer, John H.: *See*—
Katz, Murray; Sanderson, Robert A.; and Hirschenhofer, John H., 3,917,520.

Hiruma, Mituo, to Nisson Motor Company Limited. Fluid operated vehicle body level control system. 3,917,295, Cl. 280-6.00H.

Hitachi, Ltd.: *See*—
Akagi, Motoo; Oba, Yoichi; Kohashi, Takahiro; Morishita, Hazime; Kimura, Toyoaki; Nonogaki, Saburo; Oikawa, Mitsuru; Otomo, Yoshiro; and Tomita, Yoshifumi, 3,917,794.
Harada, Fumio; Yanagida, Takehiko; Fujie, Kunio; and Futawatari, Hajime, 3,916,989.
Hatsukano, Yoshikazu, 3,917,958.
Koshikawa, Tsuneji; Katakura, Kageyoshi; Kobayashi, Masaharu; and Tannaka, Yasuaki, 3,918,025.
Masai, Tadahisa; and Sato, Isao, 3,916,619.
Tomitaka, Tokuhiro, 3,917,433.

Hoag, Kip J., to McGraw-Edison Company. Portable humidifier case construction. 3,917,757, Cl. 261-30.000.

Hobart Corporation: *See*—
Davis, Kenneth E.; and Watson, William M., 3,916,670.

Hochhausen, Eugene. Long path insulating device for use in a pipeline. 3,916,954, Cl. 138-149.000.

Hochmann, Eugene; and Breitenstein, Richard C., to General Motors Corporation. Ejector mechanism for scraper. 3,916,545, Cl. 37-126.0AB.

Hoeberechts, Arthur Marie Eugene; and Kooi, Else, to U.S. Philips Corporation. Method of manufacturing a semi-conductor target for a camera tube having a mosaic of p-n junctions covered by a perforated conductive layer. 3,916,509, Cl. 29-578.000.

Hoechst Aktiengesellschaft: *See*—
Clauss, Karl; and Jensen, Harald, 3,917,589.
De Felice, Wilfried, 3,916,893.
Horlein, Gerhard; Mildenberger, Hilmar; Kroniger, Arno; Hartel, Kurt; Duwel, Dieter; and Kirsch, Reinhard, 3,917,635.
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Martini, Thomas, 3,917,724.
Szczepanski, Norbert; and Baessler, Konrad, 3,917,723.
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Weber, Helmut; Aumuller, Walter; Weyer, Rudi; Muth, Karl; and Schmidt, Felix Helmut, 3,917,690.

Hoerner Waldorf Corporation: *See*—
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Hoffman, Charles T., Jr.; and Warwick, Edward H., to General Motors Corporation. Single mount and guide pin for a caliper of a disc brake assembly. 3,917,032, Cl. 188-73.300.

Hoffman, Hellmut; Behrenz, Wolfgang; and Hammann, Ingeborg, to Bayer Aktiengesellschaft. Thiono-phosphoric(phosphonic) acid ester formaldoximes. 3,917,751, Cl. 260-940.000.

Hoffman, Joseph Adrian, to American Cyanamid Company. Poly (phosphine oxide) flame retardants for polymers. 3,917,560, Cl. 260-45.9NP.

Hoffmann-La Roche Inc.: *See*—
Furlenmeier, Andre; Lanz, Paul; Vogler, Karl, deceased; and Zanetti, Guido, 3,917,584.
Grethe, Guenter; and Uskokovic, Milan Radoje, 3,917,612.
Kyburz, Emilio; and Spiegelberg, Hans, 3,917,669.
Leimgruber, Willy; and Weigele, Manfred, 3,917,632.
Leimgruber, Willy; and Weigele, Manfred, 3,917,646.
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Hogg, Theodore B.: *See*—
Berg, Lawrance F.; Hogg, Theodore B.; and Lichti, Robert W., 3,917,322.

Hohne, Gerd; Issler, Jorg; Sohner, Gerhard; and Steinke, Leo, to Robert Bosch GmbH. Electrical signal generating device for use in combustion engines. 3,916,863, Cl. 123-148.00R.

Hoke, Donald Irvin, to Lubrizol Corporation, The. N-3-Aminoalkyl amides. 3,917,594, Cl. 260-247.20A.

Holcombe, Cressie E.; and Powell, George L., to United States of America, Energy Research and Development Administration. Method for preparing thin-walled ceramic articles of configuration. 3,917,782, Cl. 264-81.000.

Holdeman, John W.: *See*—
Kelbel, Donald W.; and Holdeman, John W., 3,916,712.
Kelbel, Donald W.; and Holdeman, John W., 3,916,718.

Holden, Ernest Michael: *See*—
Watts, Peter Edward; and Holden, Ernest Michael, 3,916,789.

Holden, Homer N.; Browning, Vernon D.; and Blevins, Bascom D., to Dayco Corporation. Method of bonding components made of thermoplastic materials. 3,917,499, Cl. 156-144.000.

Hollander, Betty Ruth; McKinley, William Earl; and Paight, George Davis, to Omega Engineering, Inc. Electrically actuated cold junction compensating device. 3,916,691, Cl. 73-361.000.

Hollenbeck, Bonderinko, to W. R. Grace & Co. Method for producing battery separator sheet. 3,917,772, Cl. 264-41.000.

Holmes, Paul M.; Brant, Douglas M.; Swope, Thomas J.; and Reinker, Joseph F., Jr., to Aeroquip Corporation. Refrigeration system valved fitting. 3,916,947, Cl. 137-544.000.

Holschneider, Felipe. Unitary foldable laminar blank for the manufacture of containers usefui as toy football helmets. 3,917,153, Cl. 229-8.000.

Holtkamp, Donald A., to Clark Equipment Company. Hydrostatic propulsion system. 3,916,625, Cl. 60-421.000.

Homeyer, Bernard: *See*—
Sirrenberg, Wilhelm; Homeyer, Bernard; Hammann, Ingeborg; and Stendel, Wilhelm, 3,917,754.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Date, Tasuku; Nakano, Soichi; and Iizuka, Yoshitoku, 3,916,850.
Matsuda, Tamotsu, 3,916,988.
Nakano, Soichi; Taguchi, Eiji; and Iizuka, Yoshitoku, 3,916,847.
Nakano, Soichi; Taguchi, Eiji; Ishii, Yoji; and Iizuka, Yoshitoku, 3,916,860.
Otani, Junji, 3,916,851.
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Taguchi, Eiji; Nakano, Soichi; and Iizuka, Yoshitoku, 3,916,858.

Honda, Tadatoshi: *See*—
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Honewell Inc.: *See*—
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Honeywell Inc.: *See*—
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Honeywell Information Systems Inc.: *See—*
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Honn, James B.: *See—*
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Hood, John W.: *See—*
Tobey, Hubert E.; Masiuk, Alphonse M.; Hood, John W.; and Irvin, Dee L., 3,917,868.

Hood, Richard A.; and Raab, Thomas L., to General Motors Corporation. Adjustable mechanism for a scraper elevator. 3,916,541, Cl. 37-8.000.

Hooker Chemicals & Plastics Corporation: *See—*
Jones, A. William, 3,916,465.

Hoon, Harry E., Jr., to Envirotech Corporation. Method and apparatus for cooling hot materials. 3,917,177, Cl. 241-57.000.

Hoover Ball and Bearing Company: *See—*
Hancock, William L., 3,916,665.

Hopkins, Michael F.: *See—*
Swisher, George W., Jr.; Hopkins, Michael F.; and Gepfert, Robert K., 3,917,084.

Hoppstock, Frederick H.: *See—*
Frech, Kenneth J.; Hoppstock, Frederick H.; and Hutchings, David A., 3,917,736.

Horiba, Mitsuyoshi: *See—*
Noyori, Yasumasa; and Horiba, Mitsuyoshi, 3,918,058.

Horlein, Gerhard; Mildenberger, Hilmar; Kroniger, Arno; Hartel, Kurt; Duwel, Dieter; and Kirsch, Reinhard, to Hoechst Aktiengesellschaft. 2-Carbomethoxy-aminobenzimidazoles. 3,917,635, Cl. 260-309.200.

Horn Construction Co., Inc.: *See—*
Lynch, Henry J.; and Fleishman, Leonard, 3,916,635.

Horn, Donald N.; and Randmae, Rein S., to First Foto, Inc. Camera and film magazine therefor. 3,918,075, Cl. 354-213.000.

Horn, F. Hubbard, deceased (by Horn, Helen W., executrix), to General Electric Company. Method of making improved planar devices including oxide-nitride composite layer. 3,917,495, Cl. 148-187.000.

Horn, Helen W., executrix: *See—*
Horn, F. Hubbard, deceased, 3,917,495.

Hornle, Reinhold: *See—*
Baurecht, Heinz-Ewald; Preuss, Manfred; Wolf, Karlheinz; and Hornle, Reinhold, 3,917,556.

Horst, Wilfried: *See—*
Schuppler, Emil; Ammazzalorso, Mario; Coldewey, Heiko; and Horst, Wilfried, 3,916,973.

Horster, Franz Adolf, to Merck Patent Gesellschaft mit beschrankter Haftung. Compositions comprising d-thyroxine and d-triiodothyronine. 3,917,832, Cl. 424-319.000.

Horstkorte, Helmut: *See—*
Clas, Wilhelm; and Horstkorte, Helmut, 3,917,550.

Horstmann, Bernhard, to International Harvester Company. Compression-ignition engine. 3,916,864, Cl. 123-191.00R.

Horton, Edward L.: *See—*
Rose, James J.; and Horton, Edward L., 3,916,568.

Hoshika, Mitsuhisa; and Suzuki, Tsutomu, to Omron Tateisi Electronics Co. Traffic signal control apparatus. 3,918,026, Cl. 340-40.000.

Hosoyama, Takashi: *See—*
Kumakura, Toshimi; and Hosoyama, Takashi, 3,917,419.

Houlihan, William J., to Sandoz, Inc. 1-(2,6-Dimethyl-2-octen-8-yl)-2-substituted or unsubstituted phenylimidazoles. 3,917,634, Cl. 260-309.000.

Howard, Orvel. Rotary blade rake. 3,916,607, Cl. 56-17.500.

Howard, Richard W.; and Weier, Roman J., to Wyard Industries, Inc. Destacking apparatus. 3,917,082, Cl. 214-8.50D.

Howard, Robert N.; and Sowman, Harold G., to Minnesota Mining and Manufacturing Company. Spheroidal composite particle and method of making. 3,916,584, Cl. 51-308.000.

Howard, Stephen F.: *See—*
Carpenter, David M.; and Howard, Stephen F., 3,916,971.

Howcroft, Robert Kent: *See—*
Tingey, Bruce K.; and Howcroft, Robert Kent, 3,917,268.

Howden, Harry, to U.S. Philips Corporation. Manufacture of optical elements. 3,917,766, Cl. 264-1.000.

Howe, Lowell I.: *See—*
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Howell Laboratories, Incorporated: *See—*
Villaume, Henry F.; Collins, Stephen D.; and Brauns, Robert Gary, 3,916,936.

Howie, Francis Henry: *See—*
Sayce, Ian George; and Howie, Francis Henry, 3,917,479.

Hoyer, Manfred, to Klockner-Humboldt-Deutz Aktiengesellschaft. Change gear transmission, especially for motor vehicles used for agricultural purposes and the construction industry. 3,916,711, Cl. 74-360.000.

Hoyle, Edgar: *See—*
Hawtree, George; and Hoyle, Edgar, 3,916,723.

Hoyle, Vinton A., to Eastman Kodak Company. Preparation of disperse methine dye compounds. 3,917,604, Cl. 260-283.0CN.

Hritz, George G.: *See—*
Leach, Bruce E.; and Hritz, George G., 3,917,808.

Hruza, Denis E., Sr.: *See—*
Slangan, Gary; Pittet, Alan O.; Giacino, Christopher; Hruza, Denis E., Sr.; and Shuster, Edward J., 3,917,870.

Hsia, Sung Lan: *See—*
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Hubbert, Millie. Hairspray shield. 3,916,917, Cl. 132-9.000.

Huber, Donald A.: *See—*
McKenzie, Donald E.; Birk, James R.; Yosim, Samuel J.; and Huber, Donald A., 3,916,617.

Huber, Wolfgang; and Marx, Anton, to SKF Industrial Trading and Development Company. Packing seal. 3,917,288, Cl. 277-59.000.

Hubich, Henry O.: *See—*
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Hudson, James Alphus, Jr.: *See—*
Boggs, Luther Miles; Flichman, Howard John; Hudson, James Alphus, Jr.; and Levengood, Johnny William, 3,916,676.

Hudson, Marshall C.: *See—*
Cook, Thomas A.; Hudson, Marshall C.; and Racki, Jerome G., 3,917,383.

Hudson, Ralph B., Jr.; and Gates, Walter C., Jr., to Texaco, Inc. Production of secondary alkyl primary amines. 3,917,706, Cl. 260-583.00M.

Huebert, Ben R. Tire curing chamber. 3,917,440, Cl. 425-18.000.

Huelskamp, Donald A., to Koehring Company. Control valve means for hydraulic press. 3,916,766, Cl. 91-411.00A.

Huff, Alvin E., to Ford Motor Company. Carburetor accelerating pump system fuel atomizer. 3,917,758, Cl. 261-34.00A.

Huff, Ray V.: *See—*
Davidson, Donald H.; and Huff, Ray V., 3,917,345.

Hugi, Bruno; Rentsch, Gunter; and Rissi, Erwin, to Sandoz Ltd. Dihydro-3-(-1-phenethyl)1,2,3,6-tetrahydro-4-pyridyl)-2(3H) furanones. 3,917,623, Cl. 260-294.80G.

Hullett, Joseph E. Anglers accessory. 3,916,554, Cl. 43-17.000.

Humbert, Francoise Ernestine Lucie; and Guth, Gerard. Esters of menthol and 2-pyrrolidone or piperidine carboxylic acids. 3,917,613, Cl. 260-293.650.

Humphrey, John H.; and Dillingham, Edward, to Data Source Corporation. Hand held optical reader. 3,918,028, Cl. 340-146.30F.

Hunter, Phillip: *See—*
Davidson, Samuel L.; Heidenreich, William C.; and Hunter, Phillip, 3,916,466.

Hurst, Robert L., to Ball Corporation. Method for handling articles of paramagnetic material. 3,917,054, Cl. 198-266.000.

Hutchings, David A.: *See—*
Frech, Kenneth J.; Hoppstock, Frederick H.; and Hutchings, David A., 3,917,736.

Hutchins, Burleigh M., Jr.: *See—*
Abrahams, Louis; and Hutchins, Burleigh M., Jr., 3,916,692.

Hutchison, John W.; and Hesch, Harold E., to Pullman Incorporated. Latching arrangement for hatch cover. 3,916,800, Cl. 105-377.000.

Hutchison, Paul Trice; and McCulloch, John William, to Bell Telephone Laboratories, Incorporated. Windshielding structure for an antenna. 3,918,065, Cl. 343-872.000.

Hutson, Jearld L. Semiconductor switching device. 3,918,082, Cl. 357-38.000.

Hydril Company: *See—*
Lewis, George E.; and Murman, Fernando, 3,917,293.

Ichim, Diona: *See—*
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ICN Pharmaceuticals, Inc.: *See—*
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Igenbergs, Eduard B.: *See—*
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Iguchi, Masakazu: *See—*
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Iguchi, Takashi: *See—*
Mimura, Akio; Wada, Masahiko; Hashimoto, Yoshiyuki; Tsuzuki, Katsuaki; Iguchi, Takashi; Kawamura, Takeshi; and Arima, Kei, 3,917,514.

Iizuka, Haruhiko: *See—*
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Nakano, Soichi; Taguchi, Eiji; and Iizuka, Yoshitoku, 3,916,847.
Nakano, Soichi; Taguchi, Eiji; Ishii, Yoji; and Iizuka, Yoshitoku, 3,916,860.
Taguchi, Eiji; Nakano, Soichi; and Iizuka, Yoshitoku, 3,916,858.

Iketani, Seijiro; Fukuda, Hiromi; and Shirai, Iwao, to Showa Densen Denran Kabushiki Kaisha. Water-cooled cable. 3,917,898, Cl. 174-15.00C.

Illinois Tool Works Inc.: *See—*
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Jakubauskas, Alexander J., 3,917,921.
Pestka, John A., 3,916,755.
Reinwall, Ernest William, Jr.; Soltysik, Edmund J.; and Lindeman, Richard Jay, 3,917,202.
Rice, Ronald B.; and Uhl, John P., 3,917,986.
Sidor, Edward F.; and Eikelberger, Rand J., 3,917,970.
Sidor, Edward F., 3,917,997.
Wilson, Robert Neil, 3,916,757.

Imai, Toshihiro; Okada, Takeshi; and Yamasita, Nobuo, to Olympus Optical Co., Ltd. Single-lens reflex optical system for an endoscope. 3,918,072, Cl. 354-62.000.

Immer, Hans U.; Sestanj, Kazimir; Nelson, Verner R.; and Gotz, Manfred K., to Ayerst McKenna and Harrison Ltd. Process for producing somatostatin and intermediates. 3,917,578, Cl. 260-112.500.

Immer, Hans U.; Sestanj, Kazimir; Nelson, Verner R.; and Gotz, Manfred K., to Ayerst McKenna And Harrison Ltd. Derivatives of somatostatin and process therefor. 3,917,581, Cl. 260-112.500.

Imperial Chemical Industries Limited: *See—*
Buckley, John; Budziarek, Richard; Nicholas, Andrew John; and Vickers, Edward Jervis, 3,917,656.
Camble, Roger; Gregory, Harold; and Gerring, Ernest Edward Lawrence, 3,917,824.
Edwards, Philip Neil, 3,917,626.
Leslie, Victor Jeffrey; and Rose, John Brewster, 3,917,715.
Paget, Hugh Patrick Dryhurst; Rogers, Leslie Richard; Royle, James Kenneth Davenport; Stansfield, James Frederick; and Topham, Arthur, 3,917,639.

Inaba, Shigeho: *See—*
Maruyama, Isamu; Nakao, Masaru; Sasajima, Kikuo; Inaba, Shigeho; and Yamamoto, Hisao, 3,917,598.

Ing. C. Olivetti & C., S.p.A.: *See—*
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Ingersoll-Rand Company: *See—*
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Ingestad, Sven Lennart: *See—*
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Inglis Nurseries Inc.: *See—*
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Inoue, Sakae; Yoneyama, Ken; Kikuchi, Motokazu; and Kataoka, Nobuyuki, to Bridgestone Tire Co., Ltd. Butadiene-acrylonitrile alternating copolymer solution-type adhesive. 3,917,554, Cl. 260-30.40A.

Inoue, Yuji, to Fujitsu Limited. Voice coil motor control system. 3,917,987, Cl. 318-135.000.

Institut de Recherches de la Siderurgie Francaise: *See—*
Borgnat, Daniel; Forestier, Guy; and Rupp, Georges, 3,917,243.

Institut De Recherches De La Siderurgie Francaise (IRSID): *See—*
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Institut Francais du Petrole, des Carburants et Lubrifiants: *See—*
Tkatchenko, Igor, 3,917,730.

Institute of Gas Technology: *See—*
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Instrumentation Laboratory, Inc.: *See—*
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International B. F. Goodrich-Europe B.V.: *See—*
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International Business Machines Corporation: *See—*
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Harper, John S.; Lean, Eric G.; Spiller, Eberhard A.; and Wilczynski, Janusz S., 3,917,384.
Patten, Michael Allen, 3,917,913.
Rueger, William J., 3,918,092.
Sherk, Thomas A., 3,917,882.
Snyder, Gary Francis; and Styczinski, David Alan, 3,918,049.

International Flavors & Fragrances Inc.: *See—*
Evers, William J.; Heinsohn, Howard H., Jr.; Mayers, Bernard J.; and Karoll, Elizabeth A., 3,917,869.
Slangan, Gary; Pittet, Alan O.; Giacino, Christopher; Hruza, Denis E., Sr.; and Shuster, Edward J., 3,917,870.

International Harvester Company: *See—*
Brudnak, Andrew, Jr.; and Isaacson, Jerrold A., 3,916,606.
Horstmann, Bernhard, 3,916,864.

International Lead Zinc Research Organization, Inc.: *See—*
Jordan, Joseph Thomas; Ward, John Joseph Bernard; and Barnes, Clive, 3,917,517.

International Telephone & Telegraph Corporation: *See—*
Sapir, Said, 3,917,359.
Tobey, Hubert E.; Masiuk, Alphonse M.; Hood, John W.; and Irvin, Dee L., 3,917,868.

Interpace Corporation: *See—*
Swanson, Harold V.; and Bald, Robert E., 3,917,285.

Interseas Associates: *See—*
Thomas, John P., 3,916,632.

Interstore Transfer Specialists, Inc.: *See—*
Dove, Douglas J. A., 3,917,154.

Inuiya, Masafumi, to Fuji Photo Film Co., Ltd. Coordinate detecting apparatus for use with optical projecting apparatus. 3,917,955, Cl. 250-549.000.

Inventec International Limited: *See—*
Hickman, Ronald Price, 3,917,427.

Inventor AB OPE: *See—*
Persson, Nils Christer, 3,916,456.

Iovine, Carmine P.: *See—*
Ray-Chaudhuri, Dilip K.; and Iovine, Carmine P., 3,917,691.

Irvin, Dee L.: *See—*
Tobey, Hubert E.; Masiuk, Alphonse M.; Hood, John W.; and Irvin, Dee L., 3,917,868.

Isaacson, Jerrold A.: *See—*
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Isensee, Gerhard: *See—*
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Ishida, Kinyu: *See—*
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Ishihara, Hisamitu: *See—*
Shirai, Haruji; Ishihara, Hisamitu; and Ogata, Taizo, 3,917,049.

Ishii, Takemochi; Iguchi, Masakazu; and Koshi, Masaki, to Japan Society for the Promotion of Machine Industry. Guiding system for a computer controlled vehicle. 3,916,798, Cl. 104-247.000.

Ishii, Yoji: *See—*
Nakano, Soichi; Taguchi, Eiji; Ishii, Yoji; and Iizuka, Yoshitoku, 3,916,860.

Isley, Loren D.; and Sipfle, Richard E., to Koehring Company. Portable load supporting platform. 3,916,677, Cl. 73-71.700.

Issler, Jorg: *See—*
Hohne, Gerd; Issler, Jorg; Sohner, Gerhard; and Steinke, Leo, 3,916,863.

Ito, Akihiko: *See—*
Nakase, Yoshiaki; Yoshida, Masaru; Iwai, Tadashi; and Ito, Akihiko, 3,917,563.

Ivancevic, Marko. Toilet ventilating apparatus in kit form. 3,916,459, Cl. 4-213.000.

Ivanov, Viktor Vasilievich; and Goritsky, Boris Sergeevich. Mechanical seal. 3,917,289, Cl. 277-74.000.

Iwai, Tadashi: *See—*
Nakase, Yoshiaki; Yoshida, Masaru; Iwai, Tadashi; and Ito, Akihiko, 3,917,563.

Iwasaki, Toshihiko: *See—*
Tamura, Yuhei; Shiozuka, Osamu; Iwasaki, Toshihiko; Fujimura, Yoshio; and Abe, Kenzo, 3,917,503.

Izumisawa, Masato, to Sony Corporation. Vertical deflection circuits for electron beam scanning. 3,917,977, Cl. 315-395.000.

J. Bobst & Fils S.A.: *See—*
Salvade, Gennaro, 3,917,259.

J. I. Case Company: *See—*
Barton, Robert M., 3,916,767.

Jackson, Dwight S. Radiographic record and film identification assembly. 3,917,952, Cl. 250-476.000.

Jackson, Harold Ernest, to Petrol Injection Limited. Fuel injection systems for internal combustion engines. 3,916,856, Cl. 123-139.0AW.

Jackson, William B., to Mobil Oil Corporation. Method of thermoforming thermoplastic foam material. 3,917,770, Cl. 264-28.000.

Jacobsen Manufacturing Company: *See—*
Akgulian, Sahag C.; and Haffner, Donald G., 3,916,849.

Jacobsson, Kurt Arne Gunnar, to Aktiebolaget IRO. Thread supply device for textile machines. 3,918,036, Cl. 340-259.000.

Jaeckel, Manfred: *See—*
Worschech, Kurt; Heyden, Rudi; Wolf, Kurt; Jaeckel, Manfred; and Eckelt, Michael, 3,917,555.

Jaeger, Raymond Edward; and Miller, Thomas John, to Bell Telephone Laboratories, Incorporated. Method for producing particulate material by freeze drying. 3,916,532, Cl. 34-5.000.

Jagenberg Werke AG: *See—*
Naudascher, Peter; and Martini, Norbert, 3,916,743.

Jahn, Paul F., to Fiber Materials, Inc. Method of making wound graphite carbon body. 3,917,884, Cl. 427-228.000.

Jain, Padam Chand: *See—*
Saxena, Anil Kumar; Jain, Padam Chand; Singh, Gurbuksh; Dua, Prithvi Raj; Srimal, Rikhab Chand; Dhawan, Bhola Nath; and Anand, Nitya, 3,917,599.

Jakubauskas, Alexander J., to Illinois Tool Works Inc. Slide actuated switch. 3,917,921, Cl. 200-333.000.

James, Granville Collis: *See—*
Agnew, James Malcolm; and James, Granville Collis, 3,916,631.

Jamesbury Corporation: *See—*
Parker, Howard W.; and Sangster, Arlon G., 3,916,479.

Jameson, George Kenneth, to Medwil Limited. Tilting bed. 3,916,882, Cl. 128-24.00R.

Janssen, Albert T.; and Narayan, Kailash, to Atlantic Richfield Company. In situ retorting system. 3,917,344, Cl. 299-2.000.

Janssen, Albert T., to Atlantic Richfield Company. Method of blasting a subterranean deposit. 3,917,346, Cl. 299-13.000.

Janssen, Albert T.; and Atlantic Richfield Company. Method of developing a permeable underground zone. 3,917,347, Cl. 299-13.000.

Janssen, Albert T., to Atlantic Richfield Company. Method of developing permeable underground zones. 3,917,348, Cl. 299-13.000.

Japan Atomic Energy Research Institute: *See—*
Nakase, Yoshiaki; Yoshida, Masaru; Iwai, Tadashi; and Ito, Akihiko, 3,917,563.

Japan Gasoline Co., Ltd.: *See—*
Toida, Tsutomu; Matsuoka, Seiichi; Yamamoto, Kenzo; and Tamura, Kouji, 3,917,467.

Japan Society for the Promotion of Machine Industry: *See—*
Ishii, Takemochi; Iguchi, Masakazu; and Koshi, Masaki, 3,916,798.
Takigawa, Kazue; and Ueno, Toshio, 3,916,646.

Jarman, Robert E.: *See—*
Smith, Fred W.; Jarman, Robert E.; and Shreve, Russell L., 3,917,313.

Jaros, Frantisek: *See—*
Doudlebsky, Ctibor; Jaros, Frantisek; Cap, Antonin; Ferka, Frantisek; Ripka, Josef; and Junek, Jan, 3,916,485.

Jarva, Inc.: *See—*
Fink, Trevor, 3,917,010.

Jarvis, James J.: *See—*
Rossitto, Vincent J.; Baker, Robert E.; Jarvis, James J.; and De Serio, James N., 3,917,104.

Jehu, Victor James: *See—*
Pearson, Leonard Charles; and Jehu, Victor James, 3,917,019.

Jenke, Dieter: *See—*
Schmoll, Heinz; and Jenke, Dieter, 3,916,668.

Jenness, Raymond C., to Allis-Chalmers Corporation. Pivoted bearing pad with circumferentially adjustable pivot point and methods of circumferentially adjusting said pivot point. 3,917,365, Cl. 308-73.000.

Jennings, James L., to Universal Oil Products Company. Combined foam flotation and membrane separation processing. 3,917,526, Cl. 210-23.000.

Jensen, Harald: *See—*
Clauss, Karl; and Jensen, Harald, 3,917,589.

Jepson, Frank M., to Nairn Coated Products, Limited. Flocked products and their manufacture. 3,917,883, Cl. 427-198.000.

Jerram, William Arthur: *See—*
Brewer, Donald; Jerram, William Arthur; and Taylor, Alan, 3,917,820.

Jex, David W.: *See—*
United States of America, National Aeronautics and Space Administration; Shriver, Edward L.; Jex, David W.; and Igenbergs, Eduard B., 3,916,761.

Joan Fabrics Corporation: *See—*
Harris, Stephen C.; Damon, John F.; and Massey, Roger L., 3,916,956.

Joerchel, Egon; and Kohlhaas, Rudolf, to Hoechst Aktiengesellschaft. Process for the preparation of phosphorus oxybromide. 3,917,803, Cl. 423-300.000.

Johansson, Bengt Olof: *See—*
Martensson, Bertil Lennart; and Johansson, Bengt Olof, 3,917,450.

John L. Dore' Co.: *See—*
Hester, Clarence H.; Petrosky, Willard L.; Stewart, Joseph T., Jr.; Murphree, Burleigh R.; and Graves, Gail W., 3,916,943.

John Wyeth & Brother Limited: *See—*
Archibald, John Leheup; and Curran, Adrian Charles Ward, 3,917,618.
Cavalla, John Frederick; and Archibald, John Leheup, 3,917,614.

Johnson, Charlie L. Stabilizing means for air or water borne vehicles. 3,916,810, Cl. 114-124.000.

Johnson, J. Walter; and Borchers, Herbert H., to Coastcom, Inc. System for multiplexing information channels adjacent to a video spectrum. 3,917,906, Cl. 179-15.0FD.

Johnson, Jay. Pneumatic boom support for hand tools. 3,917,200, Cl. 248-13.000.

Johnson & Johnson: *See—*
Kalwaites, Frank, 3,917,785.
Kelly, Robert E., 3,916,887.

Johnson, Lawrence P.; and Kitchin, Oscar G., to General Motors Corporation. Molded cage for an overrunning roller clutch. 3,917,036, Cl. 192-45.000.

Johnson, Lennart B., to Teradyne, Inc. Electrical connection apparatus. 3,917,375, Cl. 339-112.00R.

Johnson, Milton J.; and Clark, Paul M., to Whirlpool Corporation. Vacuum cleaner housing structure. 3,916,476, Cl. 15-377.000.

Johnson, Paul H.: *See—*
Evans, James P., 3,916,735.

Johnson, Robert A.: *See—*
Looker, Olin L.; Johnson, Robert A.; Scribner, Frank F.; and Slates, Larry L., 3,916,913.

Johnston, John S.; and St-Laurent, Andre, to Canadian Patents and Development Limited. Method for kerfless cutting wood. 3,916,966, Cl. 144-309.00D.

Jones, A. William, to Hooker Chemicals & Plastics Corporation. Multistream gas chromatographic method and apparatus. 3,916,465, Cl. 73-23.100.

Jones, Benjamin G.; and Leachy, Richard B., to Coatings, Inc. Method for making one-piece bimetallic connector. 3,916,518, Cl. 29-629.000.

Jones, Bernard M.; Forster, Robert H.; West, Gaylon L.; Quist, Donald G.; and Loyal, Harry C., to United States of America, Navy. Rocket launcher. 3,916,759, Cl. 89-1.814.

Jones, Cecil R., to Transfer Systems Incorporated. Fuel assemblies, grapples therefor and fuel transport apparatus for nuclear reactor power plant. 3,917,335, Cl. 294-84.00A.

Jones & Laughlin Steel Corporation: *See—*
Beam, Daniel J.; and Butler, James J., Jr., 3,917,888.

Jones, Robert E. Method and apparatus for forming brick packs with voids. 3,917,080, Cl. 214-6.00A.

Jones, Ronald E.: *See—*
Fromnick, Stephen M.; Jones, Ronald E.; and Mayer, Robert, 3,916,811.

Jones, Thomas Benjamin, to Bell Telephone Laboratories, Incorporated. Conductor with insulative layer comprising wood pulp and polyolefin fibers. 3,917,901, Cl. 174-110.00P.

Jonsson, Bo Lennart, to Centro-Maskin i Goteborg AB. Device for overturning of prismatic bodies. 3,917,079, Cl. 214-1.00G.

Jordan, Joseph Thomas; Ward, John Joseph Bernard; and Barnes, Clive, to International Lead Zinc Research Organization, Inc. Chromium plating electrolyte and method. 3,917,517, Cl. 204-43.00P.

Joseph Lucas (Industries) Limited: *See—*
Frankl, George, 3,918,016.

Junek, Jan: *See—*
Doudlebsky, Ctibor; Jaros, Frantisek; Cap, Antonin; Ferka, Frantisek; Ripka, Josef; and Junek, Jan, 3,916,485.

Jurrens, Lawrence D.; and Gingerich, Leo L., to Phillips Petroleum Company. Hot melt adhesive. 3,917,551, Cl. 260-27.0BB.

Justin Huppe, Firma: *See—*
Schuppler, Emil; Ammazzalorso, Mario; Coldewey, Heiko; and Horst, Wilfried, 3,916,973.

Justl, Fritz. Method and apparatus for erecting or building and housing or containing small animals or birds. 3,916,836, Cl. 119-17.000.

Kabanov, Nikolai Pavlovich; Schukin, Vitaly Sergeevich; Makhalov, Sergei Fedorovich; Knyazev, Jury Alexeevich; Savonichev, Dmitry Nikolaevich; and Suvorov, Vladimir Nikolaevich. Apparatus for cutting shapes out of glass sheets. 3,917,139, Cl. 225-96.500.

Kabushiki Kaisha Daini Seikosha: *See—*
Maeda, Katsutoshi, 3,916,615.
Takatsuki, Tatsuo, 3,916,614.

Kabushiki Kaisha Hattori Tokeiten: *See—*
Mizutani, Seiki; and Kaneda, Yasuyoshi, 3,917,966.

Kabushiki Kaisha Suwa Seikosha: *See—*
Goto, Mitsuhiro, 3,917,934.

Kabushiki Kaisha Yaskawa Denki Seisakusho: *See—*
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Kabushikikaisha Itoya: *See—*
Kumakura, Toshimi; and Hosoyama, Takashi, 3,917,419.

Kadowaki, Syujiro: *See—*
Takahashi, Toru; and Kadowaki, Syujiro, 3,917,398.

Kaestner, Paul T. Optical apparatus for determining focus. 3,917,409, Cl. 356-125.000.

Kahn, Bruce E., to Bel-Art Products, Inc. Squeeze type device for dispensing liquid medicaments or the like to a bodily organ. 3,917,119, Cl. 222-108.000.

Kaiser Aluminum & Chemical Corporation: *See—*
Robinson, Ivan B., 3,917,151.

Kaiser, Carl; and Ross, Stephen T., to SmithKline Corporation. Alpha-aminoalkyl-4-hydroxy-3-alkylsulfonylmethylbenzyl alcohols. 3,917,704, Cl. 260-570.600.

Kaiser, Carl; and Ross, Stephen T., to Smith Kline Corporation. Alpha-aminoalkyl-4-hydroxy-3-ureidobenzyl alcohols as bronchodilators. 3,917,847, Cl. 424-322.000.

Kaiser, Julius A., Jr. Sound radiating structure. 3,917,024, Cl. 181-163.000.

Kalfadelis, Charles D.; and Skopp, Alvin, to Exxon Research & Engineering Co. Incineration of nitrogenous materials. 3,916,805, Cl. 110-7.00R.

Kali-Chemie AG: *See—*
Thies, Peter Willibrord, 3,917,651.

Kalopissis, Gregoire; and Bouillon, Claude, to L'Oreal. Cosmetic compositions containing N-oxypyridyl derivatives. 3,917,815, Cl. 424-45.000.

Kalwaites, Frank, to Johnson & Johnson. Method for producing nonwoven fabric. 3,917,785, Cl. 264-108.000.

Kamogawa, Nin-ichi: *See—*
Kojima, Motoki; Kamogawa, Nin-ichi; and Fujii, Haruo, 3,916,830.

Kampf, Herbert, to Erwin Kampf Maschinenfabrik, Firma. Tenter clip machine for biaxially stretching thermoplastic film. 3,916,491, Cl. 26-57.00R.

Kanazawa, Teruo: *See—*
Araki, Ikuo; Takizuka, Michinori; and Kanazawa, Teruo, 3,916,618.

Kane, James F., to Signetics Corporation. MOS transistor logic circuit. 3,917,960, Cl. 307-238.000.

Kanebo, Ltd.: *See—*
Matsui, Masao; Tokura, Susumu; and Yamabe, Masahiro, 3,916,611.
Nishida, Takeshi, 3,917,784.

Kaneda, Yasuyoshi: *See—*
Mizutani, Seiki; and Kaneda, Yasuyoshi, 3,917,966.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See—*
Matsumura, Shoichi; Wakabayashi, Hiroshi; Nakagawa, Toru; and Fujii, Shigeru, 3,917,747.

Kaneko, Takeshi: *See—*
Sato, Hiroshi; Takahashi, Hiroji; Kaneko, Takeshi; and Takemura, Toro, 3,917,776.

Kaplan, Ephraim H.: *See—*
Richter, Sidney B.; and Kaplan, Ephraim H., 3,917,664.

Kaplan, Joel H.: *See—*
Groves, James N.; and Kaplan, Joel H., 3,917,451.

Kapp, Wolfgang, to Deutsche Gesellschaft fur Schadlings-bekampfung mbH. Pesticide comprising aluminum phosphide. 3,917,823, Cl. 424-128.000.

Karim, Sultanali M. M. Use of prostaglandins E and F for induction of labor. 3,917,864, Cl. 424-305.000.

Karnavas, James A.: *See—*
Pelczarski, Eugene A.; Karnavas, James A.; and La Rosa, Paul J., 3,917,795.

Karoll, Elizabeth A.: *See—*
Evers, William J.; Heinsohn, Howard H., Jr.; Mayers, Bernard J.; and Karoll, Elizabeth A., 3,917,869.

Karras, Ernest C., to Tekno Industries, Inc. Telephone service observation system. 3,917,915, Cl. 179-175.20C.

Kasik, Robert L.; and Peterson, Marvin A., to Beatrice Foods Company. Cheese extender. 3,917,854, Cl. 426-573.000.

Katakura, Kageyoshi: *See—*
Koshikawa, Tsuneji; Katakura, Kageyoshi; Kobayashi, Masaharu; and Tannaka, Yasuaki, 3,918,025.

Kataoka, Nobuyuki: *See—*
Inoue, Sakae; Yoneyama, Ken; Kikuchi, Motokazu; and Kataoka, Nobuyuki, 3,917,554.

Katayama, Yoshihiko: *See—*
Aishima, Itsuho; Saurai, Hisaya; Kitaoka, Atsushi; and Katayama, Yoshihiko, 3,917,746.

Kato, Kosei, to Tomy Kogyo Co., Inc. Toy kissing doll. 3,916,561, Cl. 46-118.000.

Kato, Makoto; and Okino, Yoshihiro, to Matsushita Electric Industrial Company, Limited. Method of hologram recording with reduced speckle noise. 3,917,380, Cl. 350-3.500.

Kato, Saburo; and Yamada, Isao, to Ricoh Co., Ltd. Apparatus for erasing magnetic records of the spiral scanning type. 3,918,089, Cl. 360-66.000.

Katsura, Katsutoshi: *See—*
Yanase, Shigeru; and Katsura, Katsutoshi, 3,917,283.

Katunich, Samuel; and McKelvey, George C., to United States Steel Corporation. Starting tubes through a drawing die. 3,916,664, Cl. 72-274.000.

Katz, Marvin LaVerne, to Atlantic Richfield Company. Method of producing natural gas from a subterranean formation. 3,916,993, Cl. 166-248.000.

Katz, Murray; Sanderson, Robert A.; and Hirschenhofer, John H., to United Technologies Corporation. Electrolysis cell system and process for generating hydrogen and oxygen. 3,917,520, Cl. 204-129.000.

Kaufman, Harold B., Jr.; Roth, Howard; and McCarthy, John P., to DCA Food Industries Inc. Method for forming an annular food ring. 3,917,863, Cl. 426-283.000.

Kavits, Victor B.: *See—*
Small, Samuel N.; Friedman, Bernard; and Kavits, Victor B., 3,917,261.

Kawabata, Hidetoshi: *See—*
Tanaka, Susumu; Enoguchi, Yuji; and Kawabata, Hidetoshi, 3,917,397.

Kawaguchi, Munetaka; and Nakabayashi, Hirohiko, to Sumitomo Electric Industries, Ltd. Solderable and thermostable insulated wires. 3,917,892, Cl. 428-383.000.

Kawamoto, Kinji; Tsunoo, Masahiko; and Omura, Masuo, to Matsushita Electric Industrial Co., Ltd. Frequency conversion system for an electronic musical instrument. 3,916,752, Cl. 84-1.190.

Kawamura, Takeshi: *See—*
Mimura, Akio; Wada, Masahiko; Hashimoto, Yoshiyuki; Tsuzuki, Katsuaki; Iguchi, Takashi; Kawamura, Takeshi; and Arima, Kei, 3,917,514.

Kawarada, Akira: *See—*
Hashimoto, Tohru; Kawarada, Akira; and Tamura, Sachiko, 3,917,477.

Kawashima, Yutaka: *See—*
Naito, Noriho; Kawashima, Yutaka; and Masuda, Akira, 3,916,857.

Kawneer Company, Inc.: *See—*
Biebuyck, Lawrence F., 3,916,595.

Kay, George J.; and Keskinen, Alan, to Vacco Industries, Inc. Sound suppressing gas flow control device. 3,917,222, Cl. 251-127.000.

Kazakov, Viktor Fedorovich: *See—*
Konin, Mikhail Alexeevish; Alexeikin, Anatoly Ilich; Nikolaev, Petr Ivanovich; Kazakov, Viktor Fedorovich; and Alshin, Nikolai Stepanovich, 3,916,959.

Kearney-National Inc.: *See—*
Murdock, Robert E., 3,917,374.

Keen, Harry J., to Colt Industries Operating Corporation. Scale lightning protection system. 3,917,981, Cl. 317-61.500.

Kegelart, Willy; and Nisol, Francis, to Solvay & Cie. Method of making alkali metal percarbonates. 3,917,663, Cl. 423-415.00P.

Kehl, Niklaus: *See—*
Kreis, Egon; and Kehl, Niklaus, 3,916,872.

Kehrer, Fritz: *See—*
Bitterli, Peter; and Kehrer, Fritz, 3,917,641.

Keith, Willis C.: *See—*
Shinn, Robert D.; and Keith, Willis C., 3,917,681.

Kelbel, Donald W.; and Holdeman, John W., to Borg-Warner Corporation. Transmission with transversely movable countershaft extension. 3,916,712, Cl. 74-410.000.

Kelbel, Donald W.; and Holdeman, John W., to Borg-Warner Corporation. Transmission control. 3,916,718, Cl. 74-471.00R.

Keldany, Rachid, to Ruti Machinery Works Ltd. Apparatus for the storage of weft threads. 3,916,935, Cl. 139-122.00R.

Keller & Knappich Augsburg, Zweigniederlassung der Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft: *See—*
Uhl, Siegfried, 3,916,958.

Kellner, Jackson M., to Smith International, Inc. Floorlevel motion compensator. 3,917,006, Cl. 175-5.000.

Kelly, Robert E., to Johnson & Johnson. Surgical drape with adhesive on top and bottom. 3,916,887, Cl. 128-132.00D.

Kemp, Stanley William, to General Motors Corporation. Pressure responsive visual warning devices. 3,916,817, Cl. 116-70.000.

Kendle, Keith Emery: *See—*
Feather, Peter; Kendle, Keith Emery; and Telford, John Michael, 3,917,658.

Kenics Corporation: *See—*
Grout, Kenneth M.; and Devellian, Richard D., 3,917,811.

Kennecott Copper Corporation: *See—*
Davidson, Donald H.; and Huff, Ray V., 3,917,345.

Kennedy, Raymond A. Method and apparatus for automatic carcass cutting. 3,916,484, Cl. 17-52.000.

Keogh, Michael J.: *See—*
Cotter, Robert J.; and Keogh, Michael J., 3,917,469.

Kerlin, Eliot E.: *See—*
Estes, James M.; Kerlin, Eliot E.; and Blum, Harold A., 3,916,871.

Kerr, George, to U.S. Philips Corporation. Multiemitter transistor with continuous ballast resistor. 3,918,080, Cl. 357-36.000.

Kerr-McGee Chemical Corporation: *See—*
Baldwin, Roger Allen; Hawthorne, Marion Frederick; and Cheng, Ming Tzu, 3,917,719.

Kerst, Al F.; and Douros, John D., Jr., to Gates Rubber Company, The. Diethyl alpha phosphonate as an (antimicrobial agent) algaecide. 3,917,476, Cl. 71-67.000.

Kerstholt, Fritz, to GerdiKerstholt geb. Spath; and Kersthott, Fritz. Article of furniture with a multi-section support surface. 3,916,461, Cl. 5-66.000.

Kersthott, Fritz: *See—*
Kerstholt, Fritz, 3,916,461.

Keskinen, Alan: *See—*
Kay, George J.; and Keskinen, Alan, 3,917,222.

Ketley, Gilroy Reginald, to Hawker Siddeley Dynamics Limited. Propulsive ducted fans. 3,916,620, Cl. 60-226.00A.

Ketterle, Walter: *See—*
Steuer, Herbert; Pataky, Raimund; and Ketterle, Walter, 3,916,709.

Keyes, Wilmer. Apparatus for delivering power. 3,916,627, Cl. 60-721.000.

Khosla, Mahesh Chandra: *See—*
Bumpus, Francis Merlin; Khosla, Mahesh Chandra; and Smeby, Robert Rudolph, 3,917,579.
Bumpus, Francis Merlin; Khosla, Mahesh Chandra; and Smeby, Robert Rudolph, 3,917,580.

Kiencke, Uwe; and Zechnall, Martin, to Robert Bosch GmbH. Electronic governor for internal combustion engine. 3,916,865, Cl. 123-198.0DB.

Kiener, Volker: *See—*
Adolphi, Heinrich; Wunsch, Gerd; and Kiener, Volker, 3,917,826.

Kieronski, John P.; and Long, Charles W., to Whitin Machine Works, Inc. Roving frame bolster. 3,916,610, Cl. 57-71.000.

Kiey, Donald B. Composite golfing implement. 3,917,266, Cl. 273-32.00A.

Kifer, David E., to Oatey Co. Follow plate for dispensing material. 3,917,124, Cl. 222-386.000.

Kiguchi, Asahi, to Foseco International Limited. Stopper rod having fibrous protective sleeve. 3,917,110, Cl. 222-1.000.

Kijesky, Michael M., to United States of America, Navy. Circular array hydrophone simulator. 3,916,533, Cl. 35-10.400.

Kikuchi, Motokazu: *See—*
Inoue, Sakae; Yoneyama, Ken; Kikuchi, Motokazu; and Kataoka, Nobuyuki, 3,917,554.

Kilborn, Richard A.: *See—*
Padula, Charles F.; Spitzberg, Larry A.; and Kilborn, Richard A., 3,917,391.

Kim, Young D.: *See—*
Gardikes, John J.; and Kim, Young D., 3,917,558.

Kimberly-Clark Corporation: *See—*
Thompson, Lenore E., 3,916,447.

Kimura, Toyoaki: *See—*
Akagi, Motoo; Oba, Yoichi; Kohashi, Takahiro; Morishita, Hazime; Kimura, Toyoaki; Nonogaki, Saburo; Oikawa, Mitsuru; Otomo, Yoshiro; and Tomita, Yoshifumi, 3,917,794.

Kincaid, Keith L. Circular saw blade sharpener. 3,916,731, Cl. 76-41.000.

King, Donald A., to Davis Water & Waste Industries, Inc. Sewage treatment plant. 3,917,532, Cl. 210-199.000.

King, Ernest V.: *See—*
West, Thomas B.; King, Ernest V.; and Hindman, William S., 3,916,653.

King Instrument Corporation: *See—*
King, James L., 3,917,184.

King, James L., to King Instrument Corporation. Method and apparatus for loading cassettes with magnetic tape. 3,917,184, Cl. 242-56.800.

King, Terance M.: *See—*
Pearne, Frank S.; Pearne, Florentin J.; Osborn, William P.; King, Terance M.; and Guzzetta, Joseph A., 3,917,081.

Kinjo, Kikuo: *See—*
Fida, Takeshi; Nishide, Katsuhiko; Yamanouchi, Teruo; and Kinjo, Kikuo, 3,917,482.

Kinoshita, Kazuhisa: *See—*
Mimino, Tohru; Kinoshita, Kazuhisa; Shinoda, Takayuki; and Minegishi, Isao, 3,917,493.

Kipp, Kevin K.: *See—*
Oswitch, Stanley; and Kipp, Kevin K., 3,917,790.

Kirin Beer Kabushiki Kaisha: *See—*
Kitamura, Kumpei; Yamamoto, Yasushi; Kokubo, Eiichi; and Kuroiwa, Yoshiro, 3,917,510.

Kirk, Clair Francis. Minimum friction bearing. 3,917,367, Cl. 308-206.000.

Kirk, Merritt C., Jr.; and Andersson, Craig R., to Sun Ventures, Inc. Method for treating cracked gas oil. 3,917,557, Cl. 260-33.6UA.

Kirsch, M. Jack, to Technal Corporation. Dry mount apparatus. 3,917,922, Cl. 219-243.000.

Kirsch, Reinhard: *See—*
Horlein, Gerhard; Mildenberger, Hilmar; Kroniger, Arno; Hartel, Kurt; Duwel, Dieter; and Kirsch, Reinhard, 3,917,635.

Kisaki, Hisashi; Tsutsumi, Yukihiro; and Takeshige, Koshuke, to Toyo Soda Manufacturing Co., Ltd. Process for producing allylacetate. 3,917,676, Cl. 260-497.00A.

Kishkovsky, Zbignev Nikolaevich: *See—*
Merzhanian, Artemy Arutjunovich; Brusilovsky, Sergei Alexeevich; Sarishvili, Naskid Grigorievich; Kishkovsky, Zbignev Nikolaevich; Bronshtein, Isaal Iosifovich; and Gagarin, Mikhail Alexeevich, 3,916,775.

Kitamoto, Tatsuji: *See—*
Dezawa, Shin-Ichiro; and Kitamoto, Tatsuji, 3,917,716.

Kitamura, Kumpei; Yamamoto, Yasushi; Kokubo, Eiichi; and Kuroiwa, Yoshiro, to Kirin Beer Kabushiki Kaisha. Lysis of yeast cell walls. 3,917,510, Cl. 195-2.000.

Kitaoka, Atsushi: *See—*
Aishima, Itsuho; Saurai, Hisaya; Kitaoka, Atsushi; and Katayama, Yoshihiko, 3,917,746.

Kitasato Institute, The: *See—*
Yoshioka, Morimasa; and Hayatsu, Eizo, 3,917,819.

Kitchin, Oscar G.: *See—*
Johnson, Lawrence P.; and Kitchin, Oscar G., 3,917,036.

Kitrilakis, Sotiris: *See—*
Buck, Keith E.; Kitrilakis, Sotiris; and Robinson, Thomas C., 3,916,888.

Klassen, David Dubble; and Brozenske, Donald Alan, to General Electric Company. Method and means for balancing a gas turbine engine. 3,916,495, Cl. 29-156.40R.

Klassen, Horst Willi: *See—*
Rath, Heinrich Bernard; and Klassen, Horst Willi, 3,917,033.

Kleemann, Axel: *See—*
Beschke, Helmut; Kleemann, Axel; and Schreyer, Gerd, 3,917,542.

Klein, Heinrich; and Pieper, Rudolf, to Siemens Aktiengesellschaft. Rotary flow separator for fine grain particles. 3,917,568, Cl. 209-144.000.

Klein. Schanzlin & Becker Aktiengesellschaft: *See—*
Picmaus, Ernst; and Bach, Bernhard, 3,917,993.

Kletschka, Harold D.; and Rafferty, Edson H., to Bio-Medicus, Inc. Suction surgical instrument of the forceps type. 3,916,909, Cl. 128-354.000.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See—*
Hoyer, Manfred, 3,916,711.

Kloesel, Joseph A., Jr.; and Rodgers, Otis Ned, to Smith International, Inc. Box hole drill steel. 3,917,319, Cl. 285-39.000.

Klomp Edward D., to General Motors Corporation. Internal combustion rotary engine. 3,916,845, Cl. 123-8.450.

Klumpes, Hans: *See—*
Bakker, Rudolf G.; and Klumpes, Hans, 3,916,977.

Knapp, Heinrich; and Schwartz, Reinhard, to Robert Bosch, GmbH. Fuel injection apparatus for internal combustion engines. 3,916,842, Cl. 123-32.0EA.

Knippel, Willis Harding, to Pullman Incorporated. Hydro-pneumatic cushion gear for railway car. 3,917,075, Cl. 213-8.000.

Knobloch, James O., to Standard Oil Company. Polytetrahalobenzene dicarboxylic anhydrides. 3,917,750, Cl. 260-890.000.

Knodel, Peter; Mayer, Gerhard; Munsterer, Horst; and Wagner, Reinhold, to Aluminium Norf GmbH. Device for coating strip material in continuous operation. 3,916,824, Cl. 118-224.000.

Knudsen, Walter Ganter, to Electrostatic Equipment Corporation. Electrostatic coating apparatus. 3,916,826, Cl. 118-629.000.

Knyazev, Jury Alexeevich: *See—*
Kabanov, Nikolai Pavlovich; Schukin, Vitaly Sergeevich; Makhalov, Sergei Fedorovich; Knyazev, Jury Alexeevich; Savonichev, Dmitry Nikolaevich; and Suvorov, Vladimir Nikolaevich, 3,917,139.

Kobayashi, Masaharu: *See—*
Koshikawa, Tsuneji; Katakura, Kageyoshi; Kobayashi, Masaharu; and Tannaka, Yasuaki, 3,918,025.

Kobayashi, Shigeru: *See—*
Matsuzawa, Tai; Hirai, Shin-ichiro; Fujino, Masahiko; Kobayashi, Shigeru; and Yamazaki, Iwao, 3,917,825.

Kobe Steel, Ltd.: *See—*
Asada, Tsunesaburo; Komatsu, Fumiaki; Tsuge, Hideo; Yanagi, Chota; and Kuwahara, Toshiyuki, 3,917,777.

Kobel, Erich: *See—*
Larenz, Joachim; Schwarz, Theodor; and Kobel, Erich, 3,917,120.

Kobzina, John W., to Chevron Research Company. Herbicidal N-haloacetyl-1,2-dihydro-4H-3,1-benzoxazine. 3,917,592, Cl. 260-244.000.

Koch, Richard C.: *See—*
Bass, Robert J.; Koch, Richard C.; Richards, Hugh C.; and Thorpe, John E., 3,917,838.

Kochanowski, John E.: *See—*
Takekoshi, Tohru; and Kochanowski, John E., 3,917,643.

Koehler, Albert M., to Brown & Root, Inc. Offshore tower apparatus and method. 3,916,594, Cl. 52-745.000.

Koehring Company: *See—*
Huelskamp, Donald A., 3,916,766.
Isley, Loren D.; and Sipfle, Richard E., 3,916,677.

Koenig, Richard J., to General Motors Corporation. Transmission control with essentially rateless regulator valve. 3,916,934, Cl. 137-115.000.

Koff, Fred W.: *See—*
Fuhrmann, Robert; Koff, Fred W.; and Pisanchyn, John, 3,917,699.

Kogima, Miyoshi: *See—*
Miyamoto, Hiroshi; Kogima, Miyoshi; and Hashimoto, Sadao, 3,916,809.

Kohashi, Takahiro: *See—*
Akagi, Motoo; Oba, Yoichi; Kohashi, Takahiro; Morishita, Hazime; Kimura, Toyoaki; Nonogaki, Saburo; Oikawa, Mitsuru; Otomo, Yoshiro; and Tomita, Yoshifumi, 3,917,794.

Kohl, Karl. Weft inserting apparatus for a warp knitting machine. 3,916,649, Cl. 66-84.00A.

Kohler, Alfred, to SWF-Spezialfabrik fur Autozubehor Gustav Rau GmbH. Wiper blade support construction. 3,916,474, Cl. 15-250.420.

Kohlhaas, Rudolf: *See—*
Joerchel, Egon; and Kohlhaas, Rudolf, 3,917,803.

Kohn, Gustave K., Special Administrator: *See—*
Brown, Melancthon S., deceased, 3,917,845.

Kohno, Hiroshige: *See—*
Terada, Kimio; Fujita, Satoshi; Kohno, Hiroshige; and Sugiyama, Hiromu, 3,917,859.

Kojima, Motoki; Kamogawa, Nin-ichi; and Fujii, Haruo, to Konishiroku Photo Industry Co. Ltd. Magnetic brush developer. 3,916,830, Cl. 118-637.000.

Kokankikai Kogyo Kabushiki Kaisha: *See—*
Nigorikawa, Tetsu; Sakai, Masanori; and Nakajima, Masayoshi, 3,917,130.

Kokubo, Eiichi: *See—*
Kitamura, Kumpei; Yamamoto, Yasushi; Kokubo, Eiichi; and Kuroiwa, Yoshiro, 3,917,510.

Kolb, James M.: *See—*
Franks, Charles R.; Schenker, Barry A.; and Kolb, James M., 3,917,518.

Komatsu, Fumiaki: *See—*
Asada, Tsunesaburo; Komatsu, Fumiaki; Tsuge, Hideo; Yanagi, Chota; and Kuwahara, Toshiyuki, 3,917,777.

Kommanditbolaget AB Lastfordelningsinstrument & Co.: *See—*
Sten, Leif Ragnvald, 3,917,937.

Kong, George C.; and Carroll, Elwood J., to Microsystems International Limited. Printed circuit board for mounting and connecting a plurality of semiconductor devices. 3,917,984, Cl. 317-101.0CC.

Konig, Franz, to Dr. Ernst Fehrer Gesellschaft m.b.H. & Co., K.G. Textilmachinenfabrik u. Stahlbau. Machine for needling non-woven fiber webs. 3,916,494, Cl. 28-4.00R.

Konin, Mikhail Alexeevish; Alexeikin, Anatoly Ilich; Nikolaev, Petr Ivanovich; Kazakov, Viktor Fedorovich; and Alshin, Nikolai Stepanovich. Device for initial colling of filament on filament core. 3,916,959, Cl. 140-71.500.

Konishiroku Photo Industry Co. Ltd.: *See—*
Kojima, Motoki; Kamogawa, Nin-ichi; and Fujii, Haruo, 3,916,830.

Konopik, Alvin E.; and Kusko, James D., to Du Pont de Nemours, E. I., and Company. SO_xabatement. 3,917,798, Cl. 423-242.000.

Kooi, Else: *See—*
Hoeberechts, Arthur Marie Eugene; and Kooi, Else, 3,916,509.

Koontz, Carl E.: *See—*
Acton, Daniel D.; and Koontz, Carl E., 3,917,098.

Koorneef, Jacob: *See—*
Walraven, Anthonie; Koorneef, Jacob; and Potgiesse, Jan Antoon Ludolf, 3,918,091.

Korgemets, Dorothy. Adult undergarment. 3,916,901, Cl. 128-287.000.

Korn, Hugo, to Motorola, Inc. Two channel and four channel, eight track tape player. 3,918,087, Cl. 360-61.000.

Korostoff, Edward; and Zin, Gary K., to Matcon, Inc. Resilient core apparatus for fabrication of extrusion dies. 3,917,217, Cl. 249-183.000.

Korting, Reinhard, to Polysius AG. Bearing for a conveyor axle of a traveling grate. 3,917,363, Cl. 308-35.000.

Koshi, Masaki: *See—*
Ishii, Takemochi; Iguchi, Masakazu; and Koshi, Masaki, 3,916,798.

Koshikawa, Tsuneji; Katakura, Kageyoshi; Kobayashi, Masaharu; and Tannaka, Yasuaki, to Hitachi, Ltd. Ultrasonic imaging apparatus for three-dimensional image display. 3,918,025, Cl. 340-1.00R.

Koster, Aloysius J., to SSP Truck Equipment, Inc. Snatch block for cranes. 3,917,334, Cl. 294-82.00R.

Kowalik, Ronald F.: *See—*
Macrander, Max S.; and Kowalik, Ronald F., 3,917,904.

Kowalk, Ronald F.: *See—*
Macrander, Max S.; and Kowalk, Ronald F., 3,917,909.

Krackenberger, Richard E.: *See—*
VandenBerg, Willard J.; Ramsey, Robert E.; Bollman, Robert L.; Krackenberger, Richard E.; and Pieczko, George, 3,917,055.

Kramer, Hendrikus, to International B. F. Goodrich-Europe B.V. Fender. 3,917,247, Cl. 267-140.000.

Krapcho, John, to E. R. Squibb & Sons, Inc. Organic acid salts of 1-[0-[(3-dimethylaminopropyl)thio]phenyl]-3-methylurea. 3,917,678, Cl. 260-501.120.

Kratochvil, Egon; and Pech, Gunther, to Semperit AG. Method for the bellowless vulcanization of tire blanks. 3,917,791, Cl. 264-326.000.

Kravitz, Bernard L.; and Seaton, George R., to Dionics, Inc. Bilateral switching integrated circuit. 3,918,083, Cl. 357-39.000.

Kreis AG: *See—*
Kreis, Egon; and Kehl, Niklaus, 3,916,872.

Kreis, Egon; and Kehl, Niklaus, to Kreis AG. Heat storage dish. 3,916,872, Cl. 126-375.000.

Kristiansen, Asbjorn Helge. Apparatus for opening and securing of carrier bags. 3,916,603, Cl. 53-384.000.

Kristiansen, Odd: *See—*
Drabek, Jozef; Boger, Manfred; and Kristiansen, Odd, 3,917,752.

Kromer, Gunter, to Audi NSU Auto Union Aktiengesellschaft; and Wankel G.m.b.H. Side intake for a rotary internal combustion engine. 3,916,846, Cl. 123-8.450.

Kroniger, Arno: *See—*
Horlein, Gerhard; Mildenberger, Hilmar; Kroniger, Arno; Hartel, Kurt; Duwel, Dieter; and Kirsch, Reinhard, 3,917,635.

Kroposki, Lorraine M.; Yoshimine, Masao; and Freedman, Harold H., to Dow Chemical Company, The. Process for preparing phosphorothioates and phenylphosphonothioates. 3,917,621, Cl. 260-294.80K.

Kubasta, Charles J., to Xerox Corporation. Dual purpose sheet handling apparatus. 3,917,256, Cl. 271-65.000.

Kubota, Shokichi; and Akiyama, Tadahiro, to Tokico Ltd. High-pressure-drop valve. 3,917,221, Cl. 251-127.000.

Kubotera, Haruo; Nakaoka, Kazuhide; Watanabe, Kaoru; Nishimoto, Akihiko; and Tanaka, Nobuo. Continuous annealing process of steels exhibiting low yield point retarded of aging properties and good drawability. 3,917,494, Cl. 148-12.00C.

Kudamatsu, Akio; Miyamoto, Masao; and Fukazawa, Nobuo, to Bayer Aktiengesellschaft. Substituted benzyl-thiolcarbamic acid esters. 3,917,616, Cl. 260-293.730.

Kuessner, Albrecht; and Herrmann, Guenter, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Production of cycloalkanols and cycloalkanones. 3,917,708, Cl. 260-586.00R.

Kuhl, Dieter; and Marchetto, Manfredo, to Siemens Aktiengesellschaft. Apparatus for production of gaseous products. 3,917,461, Cl. 23-288.00A.

Kuhn, Earl C., to Westinghouse Electric Corporation. Vertical thrust bearing lubricant seal. 3,917,364, Cl. 308-36.100.

Kuhn S.A.: *See—*
Reber, Walter, 3,916,725.

Kuhn, William E. Method and means for the repair of severed peripheral nerves. 3,916,905, Cl. 128-334.00R.

Kuhnelt, Gert: *See—*
Plockinger, Erwin; and Kuhnelt, Gert, 3,916,978.

Kulkey, Richard E. Foldable advertising literature display rack. 3,917,073, Cl. 211-178.000.

Kumakura, Toshimi; and Hosoyama, Takashi, to Kabushikikaisha Itoya. Hand operating device for drawing a line. 3,917,419, Cl. 401-218.000.

Kumar, Surinder; and Ramachandran, Kolar S., to Quaker Oats Company, The. Process for producing a liquid casein substitute. 3,917,877, Cl. 426-656.000.

Kumar, Surinder; and Ramachandran, Kolar S., to Quaker Oats Company, The. Simulated casein from proteinaceous mixtures. 3,917,878, Cl. 426-656.000.

Kumar, Surinder; and Ramachandran, Kolar S., to Quaker Oats Company, The. Process for producing a mixture having the thermoplastic properties of casein. 3,917,879, Cl. 426-656.000.

Kuraray Co., Ltd.: *See—*
Mizukami, Tetsuo; Akahane, Takeshi; and Fuchigami, Yoshio, 3,917,682.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Amagi, Yasuo; Nishimura, Yasushi; and Uehara, Yasuo, 3,917,806.

Kuroda, Namio; and Mogi, Shigeaki, to Q. P. Corporation & Teijin Limited. Egg white composition having improved whipping properties and process for producing the same. 3,917,873, Cl. 426-568.000.

Kuroda, Nobuyuki: *See—*
Matsuura, Kazuo; Kuroda, Nobuyuki; Miyoshi, Mitsuji; and Matsuzaki, Masaomi, 3,917,575.

Kuroiwa, Yoshiro: *See—*
Kitamura, Kumpei; Yamamoto, Yasushi; Kokubo, Eiichi; and Kuroiwa, Yoshiro, 3,917,510.

Kuronen, John Michael, to Bunker Ramo Corporation. Multiwafer electrical circuit construction and method of making. 3,917,983, Cl. 317-101.0CM.

Kusko, James D.: *See—*
Konopik, Alvin E.; and Kusko, James D., 3,917,798.

Kuwahara, Toshiyuki: *See—*
Asada, Tsunesaburo; Komatsu, Fumiaki; Tsuge, Hideo; Yanagi, Chota; and Kuwahara, Toshiyuki, 3,917,777.

Kvilhaug, Vermund. Device for cleaving of carcasses of slaughtered animals. 3,916,482, Cl. 17-23.000.

Kyburz, Emilio; and Spiegelberg, Hans, to Hoffmann-La Roche Inc. Intermediates for tricyclic amines. 3,917,669, Cl. 260-471.00C.

Kyowa Hakko Kogyo Kabushiki Kaisha: *See—*
Nakayama, Kiyoshi; and Hagino, Hiroshi, 3,917,511.

Labaz: *See—*
Descamps, Marcel; and Areschka, Alex, 3,917,600.

Laboratories Ferrer S.I.: *See—*
Ferrer, Carlos; and Colome, Juan, 3,917,696.

LaBorde, Joseph N.: *See—*
Chenevert, Edward L.; LaBorde, Joseph N.; and Waltman, Robert E., 3,916,503.

LaBrec, Robert L. Adjustable vertical louver system. 3,916,774, Cl. 98-107.000.

Lacombat, Michel: *See—*
Gerard, Andre; and Lacombat, Michel, 3,917,926.

Lacombe, Jean-Pierre Charles. Fire door structure and fire safety installation including said door structure. 3,916,566, Cl. 49-7.000.

Lacy, C. Lyle: *See—*
Pearce, Larry N.; Lacy, C. Lyle; and Neumann, Arthur E., 3,917,167.

Lain, Victor Y.; and Yee, Werner, to Signacom Systems, Inc. Annunciator system communicating via a minimum available communication channel. 3,918,000, Cl. 325-64.000.

Lakeway Chemicals, Inc.: *See—*
Cousino, James L., 3,917,701.

Lakhani, Hussain G.: *See—*
Rowse, Robert A.; and Lakhani, Hussain G., 3,916,583.

Lalikos, James M.: *See—*
Gazda, Chester T.; and Lalikos, James M., 3,916,488.

Lambert, Gray; and Hanselman, Paul N. Insert assembly for record keeping. 3,917,105, Cl. 220-22.000.

Lamberti, Vincent, to Lever Brothers Company. Sulfosuccinate derivatives as detergent builders. 3,917,601, Cl. 260-247.10E.

Lamontagne, Jacques Paul-Emile: *See—*
Alpatoff, Dimitri; and Lamontagne, Jacques Paul-Emile, 3,918,044.

Landmark, Kenneth L.: *See—*
Waller, Gustav Martin; and Landmark, Kenneth L., 3,916,579.

Lane, Charles E., III, to Honeywell, Inc. Vacuum actuated test clip. 3,917,376, Cl. 339-117.00P.

Lane, George C.; Cartwright, Cyril A.; and Elmslie, Keith W., to Warner-Lambert Company. Coated razor blade. 3,916,523, Cl. 30-346.530.

Lang, Frank J. Combination mould and container-dispenser for high-viscosity fluid material. 3,917,417, Cl. 401-72.000.

Langbein, Adolf: *See—*
Merz, Herbert; Langbein, Adolf; Stockhaus, Klaus; and Wick, Helmut, 3,917,606.

Langen & Company: *See—*
Strauff, Gunther, 3,917,018.

Langer, Dennis W. Animated window display. 3,916,548, Cl. 40-106.300.

Lannan, Patrick Edward: *See—*
Thornton, David Charles; Lightner, Linn Stephen; and Lannan, Patrick Edward, 3,917,370.

Lanoie, Louis A., to Garland Industries, Inc. Resilient bushing for writing instruments and the like. 3,917,418, Cl. 401-116.000.

Lanz, Paul: *See—*
Furlenmeier, Andre; Lanz, Paul; Vogler, Karl, deceased; and Zanetti, Guido, 3,917,584.

Larenz, Joachim; Schwarz, Theodor; and Kobel, Erich, to Merck Patent Gesellschaft mit Beschraenkter Haftung. Single use container for liquid pharmaceutical compositions. 3,917,120, Cl. 222-129.000.

Larkfeldt, Birger: *See—*
Lindestrom, Lars-Erik; and Larkfeldt, Birger, 3,916,772.

La Rosa, Paul J.: *See—*
Pelczarski, Eugene A.; Karnavas, James A.; and La Rosa, Paul J., 3,917,795.

Larsen, Ronald L.: *See—*
Gaffney, Bernard J.; and Larsen, Ronald L., 3,917,889.

Larson Laboratories, Inc.: *See—*
Berenstain, Arthur Z., 3,917,127.

Lartigau, Guy: *See—*
Billet, Lucien; and Lartigau, Guy, 3,917,687.

Latham, Allen, Jr., to Haemonetics Corporation. Phlebotomy needle system incorporating means to add anticoagulant and wash liquid. 3,916,892, Cl. 128-214.00R.

LaTour, Diane J.: *See—*
Viera, Paul E.; Benincasa, Anthony; Halladay, Paul D.; and LaTour, Diane J., 3,917,861.

Laubie, Michel: *See—*
Regnier, Gilbert; Canevari, Roger; Laubie, Michel; and Poignant, Jean-Claude, 3,917,597.

Laupitz, Hans Joachim: *See—*
Waldmann, Hans; Schwarz, Wilfried; Bergfeld, Manfred; Laupitz, Hans Joachim; Muller, Klaus; and Oleszko, Thaddeus J., 3,917,516.

Laurent Bouillet, S.A.: *See—*
Giraud, Yves, 3,916,806.

Lawson, Jack M. Drapery suspension means. 3,916,975, Cl. 160-330.000.

Lazar, Remus I.; and Reichel, Richard C., to Velsicol Chemical Corporation. Dye compositions. 3,917,447, Cl. 8-92.000.

Lazarus, Stanley David: *See—*
Wells, Rodney Lee; Lofquist, Robert Alden; and Lazarus, Stanley David, 3,917,449.

Lazecki, Stanislaw V., to United Technologies Corporation. Reduction of look-up table capacity. 3,917,935, Cl. 235-156.000.

Leach, Bruce E.; and Hritz, George G., to Continental Oil Company. Method for extruding alumina. 3,917,808, Cl. 423-626.000.

Leachy, Richard B.: *See—*
Jones, Benjamin G.; and Leachy, Richard B., 3,916,518.

Lean, Eric G.: *See—*
Harper, John S.; Lean, Eric G.; Spiller, Eberhard A.; and Wilczynski, Janusz S., 3,917,384.

Lear, Gerald W.; Lockwood, Harold E.; and Pointer, Floyd E., to United States of America, Energy Research and Development Administration. Method for testing wire rope. 3,916,686, Cl. 73-158.000.

Lechner, Robert J., to Honeywell Information Systems Inc. Scanning and error checking apparatus for address development utilizing symmetric difference encoded data structure. 3,918,027, Cl. 340-146.10F.

Lectromelt Corporation: *See—*
Steffora, Theodore J.; and Schempp, Eberhard G., 3,917,241.

Lectron Products, Inc.: *See—*
Quantz, Norman G., 3,917,330.
Lee, Richard Martin; and Sach, George Sidney, to Smith Kline & French Laboratories Limited. Salicylamides and compositions thereof. 3,917,625, Cl. 260-295.0AM.
Lee, Yuan-Ho. Punch assembly. 3,916,748, Cl. 83-699.000.
Leeds & Northrup Company: *See—*
Connery, James G.; Moreland, George R.; and Underkoffler, Victor S., 3,917,524.
Leggett & Platt, Incorporated: *See—*
Higgins, Larry, 3,916,463.
Legris, Andre, to Societe Legris France S.A. Modular coupling. 3,917,318, Cl. 285-18.000.
Leimgruber, Willy; and Weigele, Manfred, to Hoffmann-La Roche Inc. 5-Amino isoxazole from 3-amino acrylonitrile. 3,917,632, Cl. 260-307.00H.
Leimgruber, Willy; and Weigele, Manfred, to Hoffmann-La Roche Inc. 4-Lower alkyl or aryl substituted-spiro[furan-2(3H),1'-phthalan]-3,3'-diones as fluorometric reagents. 3,917,646, Cl. 260-326.13R.
Leite, Robert: *See—*
Travers, Arthur; and Leite, Robert, 3,917,115.
Leland Stanford Junior University, The Board of Trustees of the: *See—*
Nunn, Timothy A., 3,918,019.
Lemelson, Jerome H.; and Elfman, Allan M. Ball for target games. 3,917,271, Cl. 273-106.00R.
Lemelson, Jerome H. Scanning system and method. 3,918,029, Cl. 340-146.3SY.
Lemstra, Herman, to Nederlandsche Wapen- en Munitiefabriek "De Kruithoorn" B.V. Disintegrating projectile. 3,916,795, Cl. 102-92.700.
Lenk, Erich, to Barmag Barmer Maschinenfabrik Aktiengesellschaft. Winding machine. 3,917,182, Cl. 242-18.00R.
Lent, William E.: *See—*
Gates, Louis E., Jr.; Lent, William E.; and Flores, Jose A., 3,917,773.
Lenz, Terry Gene: *See—*
Williams, John Ronald; and Lenz, Terry Gene, 3,917,707.
Leopoldi, Norbert. Key holder. 3,916,659, Cl. 70-456.00R.
Le Porte, Robert C.: *See—*
Gilligan, Marjorie Crocker; and Le Porte, Robert C., 3,916,537.
Lesher, James M. Security entry systems. 3,917,911, Cl. 179-37.000.
Leslie, Victor Jeffrey; and Rose, John Brewster, to Imperial Chemical Industries Limited. 4-Hydroxy-3,3',4'-trichlorodiphenyl sulphone and alkali metal salts thereof. 3,917,715, Cl. 260-607.00A.
Lester, Waldemar: *See—*
Swiden, Lennart Bror Anders; and Lester, Waldemar, 3,917,353.
Letson and Burpee Ltd.: *See—*
Allen, Francis Edwin; and Porter, Andrew Wilkinson, 3,916,680.
Leuschner, Horst, to Texas Instruments Incorporated. Electronic channel selector system with preset-at-power-on feature. 3,918,002, Cl. 328-48.000.
Leveen, Harry H. Disposable bowel clamp and detachable applicator. 3,916,908, Cl. 128-346.000.
Levengood, Johnny William: *See—*
Boggs, Luther Miles; Flichman, Howard John; Hudson, James Alphus, Jr.; and Levengood, Johnny William, 3,916,676.
Lever Brothers Company: *See—*
Lamberti, Vincent, 3,917,601.
Levin, Alfred A.: *See—*
Richter, Sidney B.; and Levin, Alfred A., 3,917,843.
Levin, Myron M., to E-Z Por Corporation. Self-closing cap with a pouring spout for containers such as cans and the like. 3,917,131, Cl. 222-556.000.
Levine, Charles A.: *See—*
Brown, William E.; Levine, Charles A.; and Tsang, Floris Y., 3,917,490.
Levon, Ernest F.: *See—*
Cusic, John W.; and Levon, Ernest F., 3,917,636.
Levy, Sidney. Composite tape and method of forming the same. 3,917,890, Cl. 428-228.000.
Lewis, George E.; and Murman, Fernando, to Hydril Company. Controlled closing pattern packing unit for blowout preventer. 3,917,293, Cl. 277-114.000.
Libicki, Henry J., to Nordson Corporation. Apparatus for manufacturing a bellows seals. 3,916,737, Cl. 82-11.000.
Liccini, Raymond P.: *See—*
Claxton, Dale H.; and Liccini, Raymond P., 3,918,009.
Lichti, Robert W.: *See—*
Berg, Lawrance F.; Hogg, Theodore B.; and Lichti, Robert W. 3,917,322.
Lidin, Sigfrid Emanuel. Roller device for a flexible sheet. 3,916,974 Cl. 160-319.000.
Lifetime Metal Products, Inc.: *See—*
Ogden, John F., 3,916,458.
Light, Thomas R., to Display Corporation International. Ejecting dispenser for articles in apertured envelopes. 3,917,113, Cl. 221-20.000.
Lightner, Linn Stephen: *See—*
Thornton, David Charles; Lightner, Linn Stephen; and Lannan, Patrick Edward, 3,917,370.
Limburg, William W.; and Marsh, Dana G., to Xerox Corporation. Photoinduced acid catalyzed depolymerization of degradable polymers. 3,917,483, Cl. 96-27.00R.
Lin, Yang-I; and Goldman, Leon, to American Cyanamid Company. Method of using trans-2-(6-amino-9H-purin-9-yl)-cyclopentanol 3,917,837, Cl. 424-253.000.
Lincoln, Robert Nelson: *See—*
George, E. Paul; and Lincoln, Robert Nelson, 3,917,982.
Lind, Theodore E.; and Burton, Richard J., to Motorola, Inc. Method of growing quartz crystals and seed plate therefor. 3,917,506, Cl. 156-621.000.
Lindae, Gerhard: *See—*
Schmidt, Hans-Joachim; Merkl, Ernst; and Lindae, Gerhard, 3,917,939.
Linde Aktiengesellschaft: *See—*
Hildebrandt, Ullrich, 3,917,897.
Nasser, Gamal El Din, 3,916,644.
Waldmann, Hans; Schwarz, Wilfried; Bergfeld, Manfred; Laupitz, Hans Joachim; Muller, Klaus; and Oleszko, Thaddeus J., 3,917,516.
Lindell, Sven Ewert: *See—*
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Lindeman, Richard Jay: *See—*
Reinwall, Ernest William, Jr.; Soltysik, Edmund J.; and Lindeman, Richard Jay, 3,917,202.
Lindestrom, Lars-Erik; and Larkfeldt, Birger, to Aktiebolaget Svenska Flaktfabriken. Device at supply air means with throttling member. 3,916,772, Cl. 98-38.000.
Lindner, Henry, to Beatrice Foods Co. Traffic barricade. 3,917,232, Cl. 256-64.000.
Lindner, Herbert: *See—*
Falckenberg, Richard; and Lindner, Herbert, 3,917,459.
Lindstrand, Bengt: *See—*
Netterstedt, Sture; and Lindstrand, Bengt, 3,916,955.
Lineberger, George T. Male incontinence device. 3,916,902, Cl. 128-295.000.
Link, Edwin A. Seal for a rotary piston device. 3,917,437, Cl. 415-125.000.
Linkow, Leonard I., to Oratronics, Inc. Device for facilitating the taking of an impression of bone portions of the mouth, and method of using same. 3,916,527, Cl. 32-17.000.
Linne, Burton Dale, to Design America Corporation. Control and counting device for copying machine. 3,917,924, Cl. 235-61.60L.
Ljungberg, Per-Allan: *See—*
Falt, Ingvar K. O.; Ljungberg, Per-Allan; and Soukup, Franz, 3,916,600.
Lockwood, Harold E.: *See—*
Lear, Gerald W.; Lockwood, Harold E.; and Pointer, Floyd E., 3,916,686.
Loepfe, Erich; and Domig, Rene, to Gebruder Loepfe AG. Apparatus for monitoring yarn-like structures. 3,916,687, Cl. 73-160.000.
Loev, Bernard, to SmithKline Corporation. N-alkenyl and N-alkynyl (2-quinolyl)thio-acetamides. 3,917,593, Cl. 260-247.10L.
Lofquist, Robert Alden: *See—*
Wells, Rodney Lee; Lofquist, Robert Alden; and Lazarus, Stanley David, 3,917,449.
Lohoff, Warren G. Soil moisture detection device. 3,916,678, Cl. 73-73.000.
Lombard, Ralph S., to Textron Inc. Speed limiting governor for internal combustion engine. 3,916,853, Cl. 123-97.00R.
Long, Charles W.: *See—*
Kieronski, John P.; and Long, Charles W., 3,916,610.
Longdin, Harry W. Toilet flush tank apparatus. 3,916,455, Cl. 4-67.00A.
Look, Merton A.: *See—*
Grant, Clyde P.; Look, Merton A.; and Lowe, Richard M., 3,916,827.
Looker, Olin L.; Johnson, Robert A.; Scribner, Frank F.; and Slates, Larry L., to FMC Corporated. Vine crop harvester pinch off roller with inserts. 3,916,913, Cl. 130-30.00R.
Loos, Theodore G.; Sklar, David F., deceased; and by Stein, Francis S., executrix. Continuous container inspection machine. 3,916,694, Cl. 73-432.00R.
Lopez, Albert; and Adams, James, to Safeway Stores, Incorporated. Pallet disassembling method and apparatus. 3,916,498, Cl. 29-200.00D.
L'Oreal: *See—*
Kalopissis, Gregoire; and Bouillon, Claude, 3,917,815.
Vanlerberghe, Guy; and Sebag, Henri, 3,917,817.
Lorieux, Rene, to Cebal. Capsule for champagne and sparkling wine bottles. 3,917,099, Cl. 215-277.000.
Loseff, Herbert S. Walking heel. 3,916,538, Cl. 36-11.500.
Lovens kemiske Fabrik Produktionsaktieselskab: *See—*
Godtfredsen, Wagn Ole, 3,917,590.
Lovie, Peter M.; and Lowery, Edwin L., to Engineering Technology Analysts, Inc. Means for altering motion response of offshore drilling units. 3,916,633, Cl. 61-46.500.
Lowe, Richard M.: *See—*
Grant, Clyde P.; Look, Merton A.; and Lowe, Richard M., 3,916,827.
Lowery, Edwin L.: *See—*
Lovie, Peter M.; and Lowery, Edwin L., 3,916,633.
Lowry, Melvin L.: *See—*
Ansevin, Ronald W.; Lowry, Melvin L.; and Traina, John E., 3,917,957.
Loy, Fred W.: *See—*
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Loyal, Harry C.: *See—*
Jones, Bernard M.; Forster, Robert H.; West, Gaylon L.; Quist, Donald G.; and Loyal, Harry C., 3,916,759.
Loyd, Lee R., to Caterpillar Tractor Co. Lip seal assembly for crankshafts. 3,917,286, Cl. 277-37.000.
Lubrizol Corporation, The: *See—*
Hoke, Donald Irvin, 3,917,594.

Lucas Aerospace Limited: *See—*
Bloom, Joseph Louis; and Smith, Trevor Stanley, 3,917,430.

Lucchesi, Oreste J.; and Whiteman, Donald A., to G. D. Searle & Co. Scintillation camera brightness calibrating apparatus. 3,917,974, Cl. 315-30.000.

Ludlum, Bobby R., to United States of America, Navy. Accelerometer tilt error compensator. 3,916,697, Cl. 73-504.000.

Ludwig, Martin; Queisser, Rudolf; and Schlossbauer, Hubert, to Siemens Aktiengesellschaft. Switching arrangement for the automatic detection of a recordable point on a moving recording carrier. 3,918,090, Cl. 360-72.000.

Ludwigsburger Maschinenbau GmbH: *See—*
Neubrand, Paul; Glaser, Karl; Prater, Martin; and Schmid, Siegfried, 3,916,738.

Lummus Company, The: *See—*
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Lummus Industries, Inc.: *See—*
Van Doorn, Donald W.; Colquett, Jack L.; Hawkins, James B.; Pease, William C., III; and Webb, Tommy W., 3,916,778.

Lungo, Antonio. Filter device. 3,918,013, Cl. 333-72.000.

Luongo, Albert M., to Thomas & Betts Corporation. Parallel splice and method of making same. 3,916,517, Cl. 29-628.000.

Luthi, Hans: *See—*
Gutjahr, Paul; and Luthi, Hans, 3,916,779.

Luzio, Guillermo F.: *See—*
Rodek, Victor; Merritt, Lauren V.; and Luzio, Guillermo F., 3,917,400.

Lynch Communication Systems, Inc.: *See—*
Galluccio, Vincent P., 3,917,908.

Lynch, Henry J.; and Fleishman, Leonard, to Horn Construction Co., Inc. Piling and method of installation. 3,916,635, Cl. 61-53.000.

Lynch, Howard M.; and Thomas, Thomas L. Decoy. 3,916,553, Cl. 43-3.000.

Lystager, Gregers. Method of manufacturing a working model of belonging together maxillas and mandibles. 3,916,524, Cl. 32-11.000.

Maag Gear Wheel & Machine Company Limited: *See—*
Wydler, Robert; and Sommer, Gerd R., 3,916,569.

Macaluso, Michael, Jr. Ice guard. 3,917,533, Cl. 210-469.000.

MacDonald, Donald C., to Chrysler Corporation. Evaporative emission controls. 3,917,109, Cl. 220-85.0VS.

Machens, Karl-Heinz; Reupke, Erich; and Isensee, Gerhard, to Massey-Ferguson Services N.V. Hydraulic controls. 3,916,624, Cl. 60-394.000.

MacLeay, Ronald Edward; and Sheppard, Chester Stephen, to Pennwalt Corporation. Tertiary-aliphatic α-(peracyl)azo compounds as initiators for the polymerization of unsaturated polyesters and vinyl monomers. 3,917,744, Cl. 260-861.000.

Macovski, Albert. Ultrasonic array for reflection imaging. 3,918,024, Cl. 340-1.00R.

Macrander, Max S.; and Kowalik, Ronald F., to GTE Automatic Electric Laboratories Incorporated. Video telephone subscriber interface circuit. 3,917,904, Cl. 179-2.0TV.

Macrander, Max S.; and Kowalk, Ronald F., to GTE Automatic Electric Laboratories Incorporated. Ring injection method for transformer coupled telephone. 3,917,909, Cl. 179-18.0HB.

Maddox, Jim, Jr.; Tate, Jack F.; and Shupe, Russell D., to Texaco Inc. Secondary recovery method. 3,916,994, Cl. 166-271.000.

Maddox, Jim, Jr.: *See—*
Shupe, Russell D.; Maddox, Jim, Jr.; and Tate, Jack F., 3,916,995.
Shupe, Russell D.; Maddox, Jim, Jr.; and Tate, Jack F., 3,916,996.

Madler, Herman J.; and Doane, Kenneth I., Sr. Off-the-road vehicle. 3,917,306, Cl. 280-104.000.

Madole, Jim M.; and Ables, Richard F., to Nalco Chemical Company. Process for the destabilization and separation of ilmenite (FEO TIO2) tailings. 3,917,529, Cl. 210-54.000.

Mae, Shinroku; and Umezu, Motosuke. Apparatus for automatic packing with bands. 3,916,599, Cl. 53-76.000.

Maeda, Hiroyuki; and Suzuki, Teruaki, to Osaka Gas Company, Ltd. & Kabushiki Kaisha Hosokawa Funtai Kogaku Kenkyusho. Crushing apparatus having centrifugal classifier. 3,917,175, Cl. 241-52.000.

Maeda, Katsutoshi, to Kabushiki Kaisha Daini Seikosha. Winding mechanism for back winding watch. 3,916,615, Cl. 58-68.000.

Mageli, Orville Leonard: *See—*
D'Angelo, Antonio Joseph; Mageli, Orville Leonard; and Sheppard, Chester Stephen, 3,917,745.

Magers, John. Adjustable columns. 3,917,208, Cl. 248-356.000.

Magill, John W. Integrated industrial and urban airport complex with passenger and fright handling facilities. 3,916,588, Cl. 52-30.000.

Magna Motor, Inc.: *See—*
Payne, James U., 3,917,988.

Magne, Frank C.: *See—*
Mod, Robert R.; Magne, Frank C.; Sumrell, Gene; Novak, Arthur F.; and Solar, James M., 3,917,638.

Magneson, Archie K. Boat loader. 3,917,094, Cl. 214-450.000.

Magnussen, Haakon T., to Spectra-Physics, Inc. Flow rate feedback control chromatograph. 3,917,531, Cl. 210-101.000.

Maier, Vincent P.: *See—*
Hasegawa, Shin; Brewster, Linda C.; and Maier, Vincent P., 3,917,512.

Maitland, Alexander, to Swiss Aluminium Ltd. Conductor rail. 3,917,039, Cl. 191-29.0DM.

Makhalov, Sergei Fedorovich: *See—*
Kabanov, Nikolai Pavlovich; Schukin, Vitaly Sergeevich; Makhalov, Sergei Fedorovich; Knyazev, Jury Alexeevich; Savonichev, Dmitry Nikolaevich; and Suvorov, Vladimir Nikolaevich, 3,917,139.

Maleski, Gregory J.: *See—*
Blackie, James W. F.; Maleski, Gregory J.; Newell, Chester W.; and Vogel, Charles A., 3,918,086.

Malgarini, Giansilvio; Marino, Emilio; and Pasero, Edoardo, to Centro Sperimentale Metallurgico S.p.A. Process for preparing the feed solid charge for fluid bed reactors. 3,917,480, Cl. 75-26.000.

Malinowski, William J., to Pyrotector, Incorporated. Smoke detector. 3,917,956, Cl. 250-564.000.

Mallinckrodt, Inc.: *See—*
Piper, Roger D., 3,917,671.
Schulman, Hyman L.; Baron, Frank A.; and Weinberg, Alan E., 3,917,695.

Mallory Composites: *See—*
Wolf, Jack D., 3,916,506.

Mallory Composites, Inc.: *See—*
Breton, Ernest J.; Wolf, Jack D.; Worden, Dexter; and Bailey, John T., 3,917,149.

Malmendier, Joseph W., to Corning Glass Works. High elastic modulus borate glass. 3,917,488, Cl. 106-50.000.

Malone, Fermer A. Roll-winding apparatus. 3,917,183, Cl. 242-56.00R.

Manes, Milton. Palatable activated carbon. 3,917,821, Cl. 424-125.000.

Manni, Charles: *See—*
Chibret, Jean; and Manni, Charles, 3,917,063.

Mao, Roger A. Multiplex display system. 3,918,041, Cl. 340-336.000.

Marathon Oil Company: *See—*
Douglas, Larry J.; and Wenger, Charles B., 3,916,997.

Maraulja, Matthew D.; Attaway, John A.; and Atkins, Cedric D., to State of Florida Department of Citrus. High protein citrus food products. 3,917,852, Cl. 426-48.000.

Maraulja, Matthew D.: *See—*
Atkins, Cedric D.; Attaway, John A.; and Maraulja, Matthew D., 3,917,867.

Marchalot, Jean-Noel, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Optimized rectangular wave guide to circular wave guide coupler. 3,918,010, Cl. 333-10.000.

Marchetto, Manfredo: *See—*
Kuhl, Dieter; and Marchetto, Manfredo, 3,917,461.

Marcotte, Robert Normand: *See—*
Walsh, Matthew John; Gaiser, Frederick Luis; and Marcotte, Robert Normand, 3,916,515.

Marine Protein Corporation: *See—*
Buss, Keen W., 3,916,834.

Marino, Emilio: *See—*
Malgarini, Giansilvio; Marino, Emilio; and Pasero, Edoardo, 3,917,480.

Marino, Joseph J., to Quigley Company, Inc. Mobile refractory gunning apparatus. 3,917,170, Cl. 239-132.300.

Marino, Santino Paul: *See—*
Sands, Michael A.; and Marino, Santino Paul, 3,917,874.

Mark, Victor, to General Electric Company. Flame retardant polycarbonate composition. 3,917,559, Cl. 260-45.70S.

Markarian, William: *See—*
Bardoni, Thomas J.; Markarian, William; and Richardson, Kenneth O., 3,916,814.

Marocco, Antonio, to Elge Establishment. Differential solenoid valve for fluid control. 3,917,218, Cl. 251-30.000.

Maroschak, Ernest J. Apparatus for forming slits in tubes. 3,916,763, Cl. 90-15.100.

Marrie, Paul A. Electrical domestic freezer. 3,916,637, Cl. 62-136.000.

Marsh, Dana G.: *See—*
Limburg, William W.; and Marsh, Dana G., 3,917,483.

Marshall, Peter John, to Mettoy Company Limited, The, EN. Projectile projecting toy gun having slidable pivotable barrel member. 3,916,867, Cl. 124-16.000.

Marshall, Robert Moore; Pak, Sung Kun; and Dardoufas, Kimon Constantine, to Allied Chemical Corporation. Polyamide yarn. 3,917,893, Cl. 428-395.000.

Martelli, Nerio, to Solvay & Cie. Process and apparatus for packaging articles. 3,916,597, Cl. 53-14.000.

Martensson, Bertil Lennart; and Johansson, Bengt Olof, to Aktiebolaget Electrolux. Apparatus for temperature simulation and control in a steam sterilizer. 3,917,450, Cl. 21-94.000.

Martin, Andre. Domestic humidifier. 3,917,759, Cl. 261-36.00R.

Martin, Carlyle J. Seal assemblies for water well casings. 3,917,292, Cl. 277-110.000.

Martin, J. Louis E., to Poclain. Hydraulic cylinder for providing reciprocation of a hydraulic jack. 3,916,768, Cl. 91-417.000.

Martin, William E., to United States of America, Navy. Method for fabricating high efficiency semi-planar electro-optic modulators. 3,916,510, Cl. 29-583.000.

Martini, Norbert: *See—*
Naudascher, Peter; and Martini, Norbert, 3,916,743.

Martini, Thomas, to Hoechst Aktiengesellschaft. Process for preparing oligomers of hexafluoropropene. 3,917,724, Cl. 260-653.10R.

Maruyama, Isamu; Nakao, Masaru; Sasajima, Kikuo; Inaba, Shigeho; and Yamamoto, Hisao, to Sumitomo Chemical Company, Limited. N-(ortho-alkoxy-phenyl)-N'-anilino-propyl-piperazines. 3,917,598, Cl. 260-268.0PH.

Marx, Anton: *See—*
Huber, Wolfgang; and Marx, Anton, 3,917,288.

Maryland Cup Corporation: *See—*
Doty, William T., 3,916,602.

Masai, Tadahisa; and Sato, Isao, to Hitachi, Ltd. Burning method for gas turbine combustor and a construction thereof. 3,916,619, Cl. 60-39.650.

Maselli, James Michael: *See—*
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Masiuk, Alphonse M.: *See—*
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Mason, Edwin W., to Mason Keller Corporation. Package. 3,917,116, Cl. 222-92.000.

Mason Keller Corporation: *See—*
Mason, Edwin W., 3,917,116.

Mason, Peter Alan, to Wickman Machine Tool Sales Limited. Hydrostatic bearings. 3,917,366, Cl. 308-122.000.

Massey, David H., to Phoenix Corporation. Organic-inorganic foamed foam. 3,917,547, Cl. 260-2.5AK.

Massey-Ferguson Inc.: *See—*
Heintz, Herman, 3,916,717.
Mueller, Otto, Jr., 3,917,002.
Radcliffe, Stanley L.; and Dornan, Arthur E., 3,917,040.

Massey-Ferguson Industries Limited: *See—*
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Massey-Ferguson Services N.V.: *See—*
Machens, Karl-Heinz; Reupke, Erich; and Isensee, Gerhard, 3,916,624.

Massey, Roger L.: *See—*
Harris, Stephen C.; Damon, John F.; and Massey, Roger L., 3,916,956.

Masson, Yves, to Pneumatiques, Caoutchouc Manufacture et Plastiques Kleber-Colombes. Vehicle tires. 3,916,968, Cl. 152-353.000.

Mast, William C.: *See—*
Hess, LLoyd D.; and Mast, William C., 3,917,749.

Masuda, Akira: *See—*
Naito, Noriho; Kawashima, Yutaka; and Masuda, Akira, 3,916,857.

Matcon, Inc.: *See—*
Korostoff, Edward; and Zin, Gary K., 3,917,217.

Matsuda, Tamotsu, to Honda Giken Kogyo Kabushiki Kaisha. Control mechanism for an air-conditioned device in automotive vehicles. 3,916,988, Cl. 165-42.000.

Matsui, Masao; Tokura, Susumu; and Yamabe, Masahiro, to Kanebo, Ltd. Mixed filament yarn. 3,916,611, Cl. 57-140.0BY.

Matsumura, Shoichi; Wakabayashi, Hiroshi; Nakagawa, Toru; and Fujii, Shigeru, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Method of producing cyclopentene copolymer. 3,917,747, Cl. 260-879.000.

Matsuoka, Seiichi: *See—*
Toida, Tsutomu; Matsuoka, Seiichi; Yamamoto, Kenzo; and Tamura, Kouji, 3,917,467.

Matsushita Electric Industrial Co., Ltd.: *See—*
Arao, Yuzuru; and Yamauchi, Terukazu, 3,916,776.
Haruki, Hiroshi; Hiroi, Yoshiyasu; and Fujimoto, Kyohei, 3,918,062.
Kato, Makoto; and Okino, Yoshihiro, 3,917,380.
Kawamoto, Kinji; Tsunoo, Masahiko; and Omura, Masuo, 3,916,752.
Nishioka, Matsuo; and Oka, Shunzo, 3,918,021.

Matsushita Electric Works, Ltd.: *See—*
Sakai, Satoshi; Shimizu, Norio; Nomura, Junji; and Ueji, Norboru, 3,916,522.
Sato, Yutaka; Nakata, Yoshinori; Nishimori, Shoji; Nishii, Takeshi; Wakita, Masayasu; and Takeshita, Yoshimasa, 3,916,512.

Matsuura, Kazuo; Kuroda, Nobuyuki; Miyoshi, Mitsuji; and Matsuzaki, Masaomi, to Nippon Oil Co., Ltd. Process for production of polyolefins. 3,917,575, Cl. 260-88.20R.

Matsuyama, Seiichi, to Mitsubishi Jukogyo Kabushiki Kaisha. Interlocking device for article transporter having pusher fingers. 3,917,053, Cl. 198-232.000.

Matsuzaki, Masaomi: *See—*
Matsuura, Kazuo; Kuroda, Nobuyuki; Miyoshi, Mitsuji; and Matsuzaki, Masaomi, 3,917,575.

Matsuzawa, Tai; Hirai, Shin-ichiro; Fujino, Masahiko; Kobayashi, Shigeru; and Yamazaki, Iwao, to Takeda Chemical Industries, Ltd. Preparation for rectal or vaginal administration containing LH-RH or its analogs. 3,917,825, Cl. 424-177.000.

Matter-Burt Co.: *See—*
Neer, Clifford H., 3,917,504.

Mautz, Frances E. Loading container means. 3,917,304, Cl. 280-43.230.

Maxey, Edwin M.: *See—*
Fabris, Hubert J.; Herold, Robert J.; and Maxey, Edwin M., 3,917,666.

May, Rudolf. Floor mopping appliance. 3,916,470, Cl. 15-98.000.

Mayer, Cornelius, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Projectile with secondary projectiles and firing apparatus for such projectile. 3,916,794, Cl. 102-92.300.

Mayer, Friedrich. Apparatus for measuring the rpm of a rotating shaft. 3,916,698, Cl. 73-518.000.

Mayer, Gerhard: *See—*
Knodel, Peter; Mayer, Gerhard; Munsterer, Horst; and Wagner, Reinhold, 3,916,824.

Mayer, Max. Pneumatic holding or clamping device. 3,917,248, Cl. 269-23.000.

Mayer, Robert: *See—*
Fromnick, Stephen M.; Jones, Ronald E.; and Mayer, Robert, 3,916,811.

Mayers, Bernard J.: *See—*
Evers, William J.; Heinsohn, Howard H., Jr.; Mayers, Bernard J.; and Karoll, Elizabeth A., 3,917,869.

Maynard, John T., to Armor Elevator Company. Transportation system with brake control and combined brake and field power supply. 3,917,029, Cl. 187-29.00R.

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McGarr, John J., to USM Corporation. Method of making polyurethane powder. 3,917,741, Cl. 260-859.00R.

McGauley, Patrick John; and Dor, Abraham A., to Hanna Mining Company, The. Method for removing oxides of sulfur from sulfur bearing gas. 3,917,800, Cl. 423-244.000.

McGinnis, Hebert E., to B. F. Goodrich Company, The. Conveyor belt with sprocket drive. 3,917,092, Cl. 214-83.360.

Mc Gowan, Francis E. Apparatus for emptying and rinsing containers. 3,916,924, Cl. 134-95.000.

McGrath, Charles A. Tennis racket. 3,917,267, Cl. 273-73.00C.

Mc Grath, James L., to Reliable Electric Company. Method of banding and cutting a strand of wires. 3,916,507, Cl. 29-526.000.

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Merz, Herbert; Langbein, Adolf; Stockhaus, Klaus; and Wick, Helmut, to Boehringer Ingelheim GmbH. N-thienylmethyl-benzomorphans and -morphinans and salts thereof. 3,917,606, Cl. 260-285.000.
Merzhanian, Artemy Arutjunovich; Brusilovsky, Sergei Alexeevich; Sarishvili, Naskid Grigorievich; Kishkovsky, Zbignev Nikolaevich; Bronshtein, Isaal Iosifovich; and Gagarin, Mikhail Alexeevich. Apparatus for wine champagnization in a continuous stream. 3,916,775, Cl. 99-277.000.
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Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, to Bayer Aktiengesellschaft. 2-Amino-4,5-dihydropyridine derivatives. 3,917,620, Cl. 260-294.80G.
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Meyer, Rich B.; and Shuman, Dennis A., to ICN Pharmaceuticals, Inc. 2-Substituted cyclic AMP derivatives. 3,917,583, Cl. 260-211.50R.
Meyers, Robert A., to TRW Inc. Removal of pyritic sulfur from coal using solutions containing ferric ions. 3,917,465, Cl. 44-2.000.
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Michlmayr, Manfred Josef, to Chevron Research Company. Aromatics hydrogenation in the presence of sulfur. 3,917,565, Cl. 208-144.000.
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Miller, Robert J., to Decision Data Computer Corporation. Sheet feeding equipment. 3,917,258, Cl. 271-9.000.
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Mimura, Akio; Wada, Masahiko; Hashimoto, Yoshiyuki; Tsuzuki, Katsuaki; Iguchi, Takashi; Kawamura, Takeshi; and Arima, Kei, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for preparing the antibiotic S 15-1. 3,917,514, Cl. 195-80.00R.
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Miyamoto, Hiroshi; Kogima, Miyoshi; and Hashimoto, Sadao, to Bridgestone Tire Company Limited; and Hakodate Seimo Sengu Kabushiki Kaisha. Protective device for gas bag of ship safety device. 3,916,809, Cl. 114-68.000.
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Mohon, Windell N.; Breglia, Denis R.; and Rodemann, Alfred H., to United States of America, Navy. Direct fire weapon simulator system. 3,916,536, Cl. 35-25.000.

Molloy, Bryan B.; and Tuttle, Ronald R., to Eli Lilly and Company. Quaternary ammonium salts of N-dialkylaminoalkyl-N-(2-indanyl)anilines. 3,917,679, Cl. 260-501.150.
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Moran, William P.; and Fearon, Robert E., to Resource Sciences, Corporation. Method and system for vibration testing of objects. 3,916,699, Cl. 73-67.200.
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Morohashi, Takashi; and Morohashi, Yuji. Structural members for buildings and buildings constructed therefrom. 3,916,592, Cl. 52-252.000.
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Murdock, Robert E., to Kearney-National Inc. Electric connector apparatus. 3,917,374, Cl. 339-111.000.
Murib, Jawad H.; Schott, Stuart; and Bonecutter, Charles A., to National Distillers and Chemical Corporation. Preparation of beryllium hydrides. 3,917,809, Cl. 423-645.000.
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Wright, Alan C.; and Chang, Hsien-Dao, 3,917,541.
Naegeli, Werner, to Pavena AG. Apparatus for impregnating textile fibers. 3,916,486, Cl. 19-66.00R.
Nagayoshi, Akio; Morii, Kenji; and Sakai, Yasunori, to Mitsubishi Petrachemical Co., Ltd.; and U C Sangyo Co., Ltd. Heat insulating hose. 3,916,953, Cl. 138-129.000.
Nairn Coated Products, Limited: *See*—
Jepson, Frank M., 3,917,883.
Naito, Noriho; Kawashima, Yutaka; and Masuda, Akira, to Nippondenso Co., Ltd. Means for controlling the exhaust recirculation. 3,916,857, Cl. 123-119.00A.
Nakabayashi, Hirohiko: *See*—
Kawaguchi, Munetaka; and Nakabayashi, Hirohiko, 3,917,892.
Nakagawa, Ryuichi; Yoshimatsu, Shiro; Fukuzawa, Akira; Sato, Akira; Mitsui, Tatsuro; Ueda, Takuya; and Ozaki, Tsuyoshi, to National Research Institute For Metals. Induction melting furnace. 3,917,896, Cl. 13-27.000.
Nakagawa, Toru: *See*—
Matsumura, Shoichi; Wakabayashi, Hiroshi; Nakagawa, Toru; and Fujii, Shigeru, 3,917,747.

Nakagawa, Toshio William, to United Technologies Corporation. Propellant compositions containing epoxy functional polymer having a saturated backbone. 3,917,496, Cl. 149-19.600.

Nakagome, Takenari; Agui, Hideo; Mitani, Toru; and Nakashita, Mitsuo. Process for the preparation on N-substituted 6,7-methylenedioxy-4-quinolone derivatives. 3,917,605, Cl. 260-283.0SY.

Nakai, Koithi: *See*—
Shirasaka, Kaname; Tomiyori, Takashi; Simizu, Nobuo; Yamashita, Iwao; and Nakai, Koithi, 3,917,502.

Nakajima, Masayoshi: *See*—
Nigorikawa, Tetsu; Sakai, Masanori; and Nakajima, Masayoshi, 3,917,130.

Nakamichi, Koya; Doi, Toshitada; and Akiba, Kosuke, to Sony Corporation. Antenna having combined elements for VHF and UHF signals. 3,918,063, Cl. 343-722.000.

Nakano, Soichi; Taguchi, Eiji; and Iizuka, Yoshitoku, to Honda Giken Kogyo Kabushiki Kaisha. Intake and exhaust system for three valve internal combustion engine. 3,916,847, Cl. 123-32.0SP.

Nakano, Soichi; Taguchi, Eiji; Ishii, Yoji; and Iizuka, Yoshitoku, to Honda Giken Kogyo Kabushiki Kaisha. Carburetor heat shield apparatus. 3,916,860, Cl. 123-122.00R.

Nakano, Soichi: *See*—
Date, Tasuku; Nakano, Soichi; and Iizuka, Yoshitoku, 3,916,850.
Taguchi, Eiji; Nakano, Soichi; and Iizuka, Yoshitoku, 3,916,858.

Nak: ɔ, Masaru: *See*—
Maruyama, Isamu; Nakao, Masaru; Sasajima, Kikuo; Inaba, Shigeho; and Yamamoto, Hisao, 3,917,598.

Nakaoka, Kazuhide: *See*—
Kubotera, Haruo; Nakaoka, Kazuhide; Watanabe, Kaoru; Nishimoto, Akihiko; and Tanaka, Nobuo, 3,917,494.

Nakase, Yoshiaki; Yoshida, Masaru; Iwai, Tadashi; and Ito, Akihiko, to Japan Atomic Energy Research Institute. Process for the production of high molecular weight polyoxymethylene by the polymerization of tetraoxane. 3,917,563, Cl. 260-67.0FP.

Nakashita, Mitsuo: *See*—
Nakagome, Takenari; Agui, Hideo; Mitani, Toru; and Nakashita, Mitsuo, 3,917,605.

Nakata, Yoshinori: *See*—
Sato, Yutaka; Nakata, Yoshinori; Nishimori, Shoji; Nishii, Takeshi; Wakita, Masayasu; and Takeshita, Yoshimasa, 3,916,512.

Nakayama, Kiyoshi; and Hagino, Hiroshi, to Kyowa Hakko Kogyo Kabushiki Kaisha. Process for preparing L-phenylalanine. 3,917,511, Cl. 195-29.000.

Nalco Chemical Company: *See*—
Madole, Jim M.; and Ables, Richard F., 3,917,529.

Nara, Harry R.: *See*—
Blower, Warren A.; and Nara, Harry R., 3,916,982.

Narayan, Kailash: *See*—
Janssen, Albert T.; and Narayan, Kailash, 3,917,344.

Narayanan, Venkatachala L.; and Bernstein, Jack, to E. R. Squibb & Sons, Inc. Adamantyl thiadiazole intermediates. 3,917,689, Cl. 260-552.0SC.

Nashua Corporation: *See*—
Cheney, George T., 3,917,068.

Nasser, Gamal El Din, to Linde Aktiengesellschaft. Dehumidifier with a plate-type evaporator. 3,916,644, Cl. 62-428.000.

National Distillers and Chemical Corporation: *See*—
Frampton, Orville D., 3,917,721.
Murib, Jawad H.; Schott, Stuart; and Bonecutter, Charles A., 3,917,809.
Platz, Gerald M.; and Honn, James B., 3,917,159.

National Research Development Corporation: *See*—
Morley, John G.; and Millman, Robert S., 3,917,030.
Pearson, Leonard Charles; and Jehu, Victor James, 3,917,019.
Sayce, Ian George; and Howie, Francis Henry, 3,917,479.

National Research Institute For Metals: *See*—
Nakagawa, Ryuichi; Yoshimatsu, Shiro; Fukuzawa, Akira; Sato, Akira; Mitsui, Tatsuro; Ueda, Takuya; and Ozaki, Tsuyoshi, 3,917,896.

National Starch and Chemical Corporation: *See*—
Ray-Chaudhuri, Dilip K.; and Iovine, Carmine P., 3,917,691.

Naudascher, Peter; and Martini, Norbert, to Jagenberg Werke AG. Apparatus and process for slitting at least two webs. 3,916,743, Cl. 83-86.000.

NCR Corporation: *See*—
Burger, William R.; Vince, Guy A.; and Mitchner, Joseph L., 3,916,785.

Neal, Eugene A.: *See*—
Canada, Joel I.; and Neal, Eugene A., 3,917,185.

Neal, Gary R., to Neal, James E., Jr.; and Hubich, Henry O., a part interest. Anti-jackknifing fifth wheel assembly. 3,917,314, Cl. 280-432.000.

Neal, James E., Jr.: *See*—
Neal, Gary R., 3,917,314.

Nederlandsche Wapen- en Munitiefabriek "De Kruithoorn" B.V.: *See*—
Lemstra, Herman, 3,916,795.

Needle, Jules S.; and Sain, William H., to Varian Associates. Electron tube duplex grid structure. 3,917,973, Cl. 313-337.000.

Neer, Clifford H., to Matter-Burt Co. Labelling machine. 3,917,504, Cl. 156-453.000.

Nelson, Daniel E. Double roller cam drives. 3,916,702, Cl. 74-57.000.

Nelson Research & Development Co.: *See*—
Fuxe, Kjell, 3,917,841.

Nelson, Verner R.: *See*—
Immer, Hans U.; Sestanj, Kazimir; Nelson, Verner R.; and Gotz, Manfred K., 3,917,578.
Immer, Hans U.; Sestanj, Kazimir; Nelson, Verner R.; and Gotz, Manfred K., 3,917,581.

Nendzig, Gerhard; and Muller, Elmar, to Pumpenfabrik Urach. Sealing arrangement. 3,916,771, Cl. 92-86.000.

Neszmelyi, Andras: *See*—
Takacs, Kalman; Szekeres, Laszlo; Harsanyi, Kalman; Papp, Gyula; Neszmelyi, Andras; and Benedek, Eva, 3,917,610.

Netterstedt, Sture; and Lindstrand, Bengt, to Fagersta AB. Tightening layer on insulated pipe lines. 3,916,955, Cl. 138-155.000.

Neubrand, Paul; Glaser, Karl; Prater, Martin; and Schmid, Siegfried, to Ludwigsburger Maschinenbau GmbH. Apparatus for machining and/or treatment of trochoidal surfaces. 3,916,738, Cl. 82-18.000.

Neumann, Arthur E.: *See*—
Pearce, Larry N.; Lacy, C. Lyle; and Neumann, Arthur E., 3,917,167.

Neville, Richard E. G.; and Garrett, John A., to AMF Incorporated. Tobacco moistening method and apparatus therefor. 3,916,915, Cl. 131-134.000.

Newcombe, Jack: *See*—
Wolford, Lionel T.; Newcombe, Jack; and Dotson, Anderson O., Jr., 3,917,642.

Newell, Chester W.: *See*—
Blackie, James W. F.; Maleski, Gregory J.; Newell, Chester W.; and Vogel, Charles A., 3,918,086.

Newstead, Ronald Alfred, to Pye Ltd. Spectrophotometer with automatically fine tuned monochromator. 3,917,407, Cl. 356-97.000.

Newton, John E.: *See*—
Reinke, Robert V.; Newton, John E.; and Reifsteck, Robert L., 3,918,068.

Neynaber Chemie GmbH: *See*—
Worschech, Kurt; Heyden, Rudi; Wolf, Kurt; Jaeckel, Manfred; and Eckelt, Michael, 3,917,555.

Niccolls, Wesley O.: *See*—
Barr, Katie H.; and Niccolls, Wesley O., 3,916,818.

Nicholas, Andrew John: *See*—
Buckley, John; Budziarek, Richard; Nicholas, Andrew John; and Vickers, Edward Jervis, 3,917,656.

Nicolaides, Ruth Vogel, to United States of America, Army. Amorphous semiconductor switch and memory with a crystallization-accelerating layer. 3,918,032, Cl. 340-173.00R.

Nicoll, Frank S., Jr.: *See*—
Polak, Zednek, 3,917,458.

Nielsen, Peter Wilhelm, to Danfoss A/S. Air inlet means for air conditioning installations or the like. 3,917,161, Cl. 236-13.000.

Nielson, Carl Calvin, to Bell Telephone Laboratories, Incorporated. Circuitry for providing call override in a PBX system in accordance with a supplied class of service. 3,917,910, Cl. 179-18.0BH.

Nier, Dieter, to Rank Xerox Ltd. Varioslit. 3,917,393, Cl. 353-101.000.

Nifco Inc.: *See*—
Yoda, Tohru, 3,916,756.

Nigorikawa, Tetsu; Sakai, Masanori; and Nakajima, Masayoshi, to Nippon Kokan Kabushiki Kaisha; Kokankikai Kogyo Kabushiki Kaisha; and Tokyo Yogyo Kabushiki Kaisha. Mounting structure for sliding nozzle unit. 3,917,130, Cl. 222-555.000.

Nihon Yushi Co., Ltd.: *See*—
Araki, Ikuo; Takizuka, Michinori; and Kanazawa, Teruo, 3,916,618.

Nikolaev, Petr Ivanovich: *See*—
Konin, Mikhail Alexeevish; Alexeikin, Anatoly Ilich; Nikolaev, Petr Ivanovich; Kazakov, Viktor Fedorovich; and Alshin, Nikolai Stepanovich, 3,916,959.

Nilsen, Walter. Method for the production of wall panels. 3,917,775, Cl. 264-46.200.

Nilsson, Karl Erik. Acceleration sensitive locking device, especially for safety belts in vehicles. 3,917,188, Cl. 242-107.400.

Nippon Electric Company, Ltd.: *See*—
Niwa, Kunihiko, 3,917,912.

Nippon Kokan Kabushiki Kaisha: *See*—
Mimino, Tohru; Kinoshita, Kazuhisa; Shinoda, Takayuki; and Minegishi, Isao, 3,917,493.
Nigorikawa, Tetsu; Sakai, Masanori; and Nakajima, Masayoshi, 3,917,130.

Nippon Oil Co., Ltd.: *See*—
Matsuura, Kazuo; Kuroda, Nobuyuki; Miyoshi, Mitsuji; and Matsuzaki, Masaomi, 3,917,575.

Nippon Pulsmotor Co. Ltd.: *See*—
Takigawa, Kazue; and Ueno, Toshio, 3,916,646.

Nippon Steel Corporation: *See*—
Takeshita, Kazuma; Sato, Kenji; and Shimazaki, Yasumi, 3,916,663.

Nippondenso Co., Ltd.: *See*—
Akashi, Tetsuji; Nishimura, Masataka; and Tsuzuki, Yoshihiko, 3,916,861.
Naito, Noriho; Kawashima, Yutaka; and Masuda, Akira, 3,916,857.

Nishida, Takeshi, to Kanebo, Ltd. Method for producing pile fabrics having excellent appearance and properties. 3,917,784, Cl. 264-103.000.

Nishide, Katsuhiko: *See*—
Fida, Takeshi; Nishide, Katsuhiko; Yamanouchi, Teruo; and Kinjo, Kikuo, 3,917,482.

Nishigaki, Kenichi: *See—*
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Doi, Hidekazu; and Nishigaki, Kenichi, 3,917,463.

Nishii, Takeshi: *See—*
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Nishimori, Shoji: *See—*
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Nishimoto, Akihiko: *See—*
Kubotera, Haruo; Nakaoka, Kazuhide; Watanabe, Kaoru; Nishimoto, Akihiko; and Tanaka, Nobuo, 3,917,494.

Nishimura, Masataka: *See—*
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Nishimura, Toshio: *See—*
Wakatsuki, Hiroe; and Nishimura, Toshio, 3,917,324.

Nishimura, Yasushi: *See—*
Amagi, Yasuo; Nishimura, Yasushi; and Uehara, Yasuo, 3,917,806.

Nishioka, Matsuo; and Oka, Shunzo, to Matsushita Electric Industrial Company, Limited. Device for simultaneously controlling a plurality of variable resistors. 3,918,021, Cl. 338-128.000.

Nisol, Francis: *See—*
Kegelart, Willy; and Nisol, Francis, 3,917,663.

Nissan Motor Company Limited: *See—*
Furuta, Tetuziro, 3,917,342.
Shimizu, Kazuaki, 3,917,034.
Takeuchi, Yasuhisa; and Iizuka, Haruhiko, 3,917,358.

Nisshin Kogyo Kabushiki Kaisha: *See—*
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Nisson Motor Company Limited: *See—*
Hiruma, Mituo, 3,917,295.

Niwa, Kunihiko, to Nippon Electric Company, Ltd. Multifrequency dialing signal receiver for push-button type telephone systems. 3,917,912, Cl. 179-84.0VF.

Noble, Peter M.: *See—*
DeIvernois, Philip J., Jr.; and Noble, Peter M., 3,916,796.

Noguchi, Masaru, to Fuji Photo Film Co., Ltd. Optical image reproducing system for a hologram using a linear white light source. 3,917,379, Cl. 350-3.500.

Nomura, Junji: *See—*
Sakai, Satoshi; Shimizu, Norio; Nomura, Junji; and Ueji, Norboru, 3,916,522.

Nomura, Takayuki. Tool holder. 3,916,739, Cl. 82-36.000.

Nonogaki, Saburo: *See—*
Akagi, Motoo; Oba, Yoichi; Kohashi, Takahiro; Morishita, Hazime; Kimura, Toyoaki; Nonogaki, Saburo; Oikawa, Mitsuru; Otomo, Yoshiro; and Tomita, Yoshifumi, 3,917,794.

Noone, Michael J., to General Electric Company. Fire resistant structure. 3,916,804, Cl. 109-78.000.

Noranda Mines Limited: *See—*
English, Christopher John, 3,916,985.

Nordson Corporation: *See—*
Libicki, Henry J., 3,916,737.

Norlin Music, Inc.: *See—*
Stich, Willi Lorenz, 3,916,751.

Normant, Henri Marie, to Rhone-Poulenc S.A. Preparation of alkali metal amides. 3,917,602, Cl. 260-268.00R.

Northeast Electronics Corporation: *See—*
Bartelink, Everhard H. B., 3,917,907.

Northern Electric Company: *See—*
Walsh, Matthew John; Gaiser, Frederick Luis; and Marcotte, Robert Normand, 3,916,515.

Northrop Corporation: *See—*
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Norton Company: *See—*
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Coes, Loring, Jr., 3,916,572.
Rowse, Robert A.; and Lakhani, Hussain G., 3,916,583.

Norton, David E.: *See—*
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Nosco Plastics, Incorporated: *See—*
Cloyd, Harold S., 3,916,894.
Cloyd, Harold S., 3,917,066.

Novak, Arthur F.: *See—*
Mod, Robert R.; Magne, Frank C.; Sumrell, Gene; Novak, Arthur F.; and Solar, James M., 3,917,638.

Noyori, Yasumasa; and Horiba, Mitsuyoshi, to Fujitsu Limited. Vehicle skid control system. 3,918,058, Cl. 343-7.0ED.

Nuckolls, Joe A., to General Electric Company. Starting and operating circuit for gaseous discharge lamps. 3,917,976, Cl. 315-258.000.

Numakura, Toshihiko; Yamagiwa, Kazuo; and Saito, Akira, to Sony Corporation. Magnetic recording and/or reproducing apparatus. 3,918,085, Cl. 358-4.000.

Nunn, Timothy A., to Leland Stanford Junior University, The Board of Trustees of the. Miniature absolute pressure transducer assembly and method. 3,918,019, Cl. 338-42.000.

Nupla Corporation: *See—*
Carmien, Joseph Allen; and Yuhos, John R., 3,917,421.

Nystrom, Bror Erik. Apparatus for surface processing. 3,916,937, Cl. 137-255.000.

Oatey Co.: *See—*
Kifer, David E., 3,917,124.

Oba, Yoichi: *See—*
Akagi, Motoo; Oba, Yoichi; Kohashi, Takahiro; Morishita, Hazime; Kimura, Toyoaki; Nonogaki, Saburo; Oikawa, Mitsuru; Otomo, Yoshiro; and Tomita, Yoshifumi, 3,917,794.

Obermaier, Frank E.; and Scott, Arthur A., to Eaton Corporation. Waterline thermostat and assembly. 3,917,163, Cl. 236-34.000.

Occidental Petroleum Corporation: *See—*
Shafer, John L., 3,917,793.

Ochsner, Paul Albert, to Givaudan Corporation. Novel odorants. 3,917,675, Cl. 260-488.00R.

Odgen, Royce G. Toothpaste dispenser for dispensing paste from a collapsible tube. 3,917,118, Cl. 222-101.000.

Ofer, Heinrich: *See—*
Helletsberger, Harald; Ofer, Heinrich; Haidacher, Wilhelm; and Geissler, Ernst, 3,916,580.

Offermanns, Heribert: *See—*
Von Bebenburg, Walter; and Offermanns, Heribert, 3,917,629.

Ogasawara, Makoto: *See—*
Urasaki, Takanori; Oka, Isao; Ogasawara, Makoto; and Shima, Takeo, 3,917,731.

Ogasawara, Satoshi: *See—*
Shiraki, Yoichi; Wakabayashi, Shoichi; Yokoyama, Mitsunobu; Yokoyama, Isao; Sugahara, Shigeji; and Ogasawara, Satoshi, 3,917,778.

Ogata, Taizo: *See—*
Shirai, Haruji; Ishihara, Hisamitu; and Ogata, Taizo, 3,917,049.

Ogawa, Francis T., to Honewell Inc. Control circuit for photographic apparatus. 3,917,395, Cl. 354-23.00D.

Ogden, John F., to Lifetime Metal Products, Inc. Swimming pool circulation system. 3,916,458, Cl. 4-172.170.

Oguri, Yoshiyuki. Vertical/short take-off and landing aircraft. 3,917,195, Cl. 244-66.000.

O'Hare, Harry M., to Federal Investment Corporation. Fluid mixing and dispensing apparatus. 3,917,172, Cl. 239-305.000.

Ohata, Satoru: *See—*
Sakurai, Yoshitoshi; and Ohata, Satoru, 3,916,852.

Ohgoshi, Akio: *See—*
Yanagisawa, Yuzuru; Ohgoshi, Akio; Yamanaka, Akira; and Muramoto, Shoichi, 3,917,972.

Ohta, Wasaburo, to Ricoh Co., Ltd. Method and apparatus for collating patterns. 3,917,402, Cl. 356-71.000.

Oikawa, Mitsuru: *See—*
Akagi, Motoo; Oba, Yoichi; Kohashi, Takahiro; Morishita, Hazime; Kimura, Toyoaki; Nonogaki, Saburo; Oikawa, Mitsuru; Otomo, Yoshiro; and Tomita, Yoshifumi, 3,917,794.

Oka, Isao: *See—*
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Oka, Shunzo: *See—*
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Okada, Takeshi: *See—*
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Okagawa, Fumihiko: *See—*
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O'Kane, James L.: *See—*
Vincent, Bennett Frank, Jr.; and O'Kane, James L., 3,917,748.

Oki, Ryuji: *See—*
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Okino, Yoshihiro: *See—*
Kato, Makoto; and Okino, Yoshihiro, 3,917,380.

Okkonen, Oliver G.; and Herring, Lloyd D., to Rowe International, Inc. Bill stacking mechanism. 3,917,260, Cl. 271-181.000.

Olerud, Sven Emanuel, to Medical Products Octagon AB. Device for the sterile enclosure of non-sterilizable objects. 3,917,160, Cl. 229-62.000.

Oleszko, Thaddeus J.: *See—*
Waldmann, Hans; Schwarz, Wilfried; Bergfeld, Manfred; Laupitz, Hans Joachim; Muller, Klaus; and Oleszko, Thaddeus J., 3,917,516.

Oliver, Michael J. Plate for adjustably mounting electrical receptacle. 3,917,899, Cl. 174-57.000.

Olsen, John G. Electric load control. 3,917,969, Cl. 307-11.000.

Olson, John Emery, to Heath Company. Television receiver with pattern generator. 3,917,902, Cl. 178-6.000.

Olstowski, Franciszek; and Parrish, Donald B., to Dow Chemical Company, The. Non-elastomeric polyurethane compositions formed from a mixture of a low molecular weight polyol and an hydroxyl containing polyoxyalkylene compound. 3,917,571, Cl. 260-77.5AP.

Olympia Werke AG: *See—*
Rix, Albert; Fuchs, Hans; Moritz, Rolf; and Ubben, Erhard, 3,916,716.

Olympus Optical Co., Ltd.: *See—*
Imai, Toshihiro; Okada, Takeshi; and Yamasita, Nobuo, 3,918,072.

Omega Engineering, Inc.: *See—*
Hollander, Betty Ruth; McKinley, William Earl; and Paight, George Davis, 3,916,691.

OMEGA Louis Brandt & Frere S.A.: *See—*
Raval, Gaston, 3,917,965.

Omron Tateisi Electronics Co.: *See—*
Hoshika, Mitsuhisa; and Suzuki, Tsutomu, 3,918,026.

Omura, Glen I., to United States of America, Navy. Apparatus for testing the resolution of an analog to digital converter. 3,918,048, Cl. 340-347.0AD.

Omura, Masuo: *See*—
Kawamoto, Kinji; Tsunoo, Masahiko; and Omura, Masuo, 3,916,752.

O'Neill, John Sidney, to British Leyland Truck & Bus Division Ltd. Heat exchanger seals. 3,917,291, Cl. 277-96.00A.

Oppenheimer, Jess. Swing training apparatus. 3,917,281, Cl. 273-191.00B.

Opti-Holding AG: *See*—
Hansen, Harry, 3,917,787.

Optigon Research & Development Corporation: *See*—
Eisenberger, Gary; and Muzslay, Steven Z., 3,917,944.

Optoechnik Heine KG: *See*—
Heine, Helmut A., 3,916,881.

Oratronics, Inc.: *See*—
Linkow, Leonard I., 3,916,527.

Orban, Julius; and Case, Charles E., to Sorbent Sciences Corporation. Foraminous composition for removal of oleophilic material from the surface of water. 3,917,528, Cl. 210-36.000.

Orenstein & Koppel AG: *See*—
Pennings, Pieter; and Scholler, Gerhard, 3,917,051.

Orr, Bobby J., to Fiat-Allis Construction Machinery, Inc. Single pedal braking system for crawler tractor. 3,917,013, Cl. 180-6.700.

Orth, George Otto, Jr., to Petrotek, Inc. Oil detection and signaling system. 3,918,034, Cl. 340-236.000.

Ortiz, Frank. Hand-actuated screw operated transplanter. 3,916,540, Cl. 37-2.00R.

Osaka Gas Company, Ltd. & Kabushiki Kaisha Hosokawa Funtai Kogaku Kenkyusho: *See*—
Maeda, Hiroyuki; and Suzuki, Teruaki, 3,917,175.

Osborn, William P.: *See*—
Pearne, Frank S.; Pearne, Florentin J.; Osborn, William P.; King, Terance M.; and Guzzetta, Joseph A., 3,917,081.

O'Shima, Yasuhiro. Method of producing plastic resin lawn-like objects. 3,917,498, Cl. 156-204.000.

Ostebee, Loren C.; and Howe, Lowell I. Safety hitch. 3,917,315, Cl. 280-457.000.

Oswald, Robert B., Jr.; and Baba, Anthony J., to United States of America, Army. Methods for fabricating resistant MOS devices. 3,917,491, Cl. 148-1.500.

Oswitch, Stanley; and Kipp, Kevin K., to Ferro Corporation. Process for molding with pre-fabricated gel coats. 3,917,790, Cl. 264-267.000.

Ota, Yoshio; and Takeda, Masashi, to Sony Corporation. Differential circuit with improved signal balance. 3,917,991, Cl. 321-8.00R.

Otani, Junji, to Honda Giken Kogyo Kabushiki Kaisha. Two-cycle internal combustion engine. 3,916,851, Cl. 123-73.00A.

Otomo, Yoshiro: *See*—
Akagi, Motoo; Oba, Yoichi; Kohashi, Takahiro; Morishita, Hazime; Kimura, Toyoaki; Nonogaki, Saburo; Oikawa, Mitsuru; Otomo, Yoshiro; and Tomita, Yoshifumi, 3,917,794.

Otsap, Ben A.: *See*—
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Ouchi, Shunji; and Shibuya, Chisei, to Deutsche Gold-und Silber-Scheideanstalt Vormals Roessler. Process for the preparation of DL-methionine. 3,917,683, Cl. 260-534.00S.

Ouwerschuur, Frank K. G.: *See*—
Van den Berg, Godfried J.; and Ouwerschuur, Frank K. G., 3,917,468.

Owens, Geoffrey Lloyd, to Dunlop Limited. Deformable bead retaining members. 3,916,970, Cl. 152-379.100.

Ozaki, Tsuyoshi: *See*—
Nakagawa, Ryuichi; Yoshimatsu, Shiro; Fukuzawa, Akira; Sato, Akira; Mitsui, Tatsuro; Ueda, Takuya; and Ozaki, Tsuyoshi, 3,917,896.

P.I.V. Antrieb Werner Reimers Kommanditgesellschaft: *See*—
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P. R. Mallory & Co. Inc.: *See*—
Puerner, George O., 3,918,022.
Smolin, Michael; and Goldstein, Sanders, 3,916,926.

Paap, Hans J.; and Pitts, Robert W., Jr. Well logging system and method using an armored coaxial cable and compensation circuit. 3,916,685, Cl. 73-152.000.

Pacific Roller Die Co., Inc.: *See*—
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Padovani, Pietro. Method for manufacturing a container having a thickened lip. 3,917,788, Cl. 264-153.000.

Padula, Charles F.; Spitzberg, Larry A.; and Kilborn, Richard A., to Warner-Lambert Company. Projection system for measuring curves and cross-sectional dimensions of hydrophilic contact lenses. 3,917,391, Cl. 353-80.000.

Paget, Hugh Patrick Dryhurst; Rogers, Leslie Richard; Royle, James Kenneth Davenport; Stansfield, James Frederick; and Topham, Arthur, to Imperial Chemical Industries Limited. Dispersing agents. 3,917,639, Cl. 260-314.500.

Paight, George Davis: *See*—
Hollander, Betty Ruth; McKinley, William Earl; and Paight, George Davis, 3,916,691.

Pak, Sung Kun: *See*—
Marshall, Robert Moore; Pak, Sung Kun; and Dardoufas, Kimon Constantine, 3,917,893.

Paknke, Hans Joachim; and Guse, Rudolf. Forging machines. 3,916,667, Cl. 72-402.000.

Pallos, Ferenc Marcus, to Stauffer Chemical Company. Certain non-terpenoid juvenile hormone mimicking compounds and their use in controlling insects. 3,917,844, Cl. 424-300.000.

Palmer, Raymond Greig. Portable individual wheel ramps. 3,917,226, Cl. 254-88.000.

Pankin International Ltd.: *See*—
Pankin, Jerome; and Feldman, Beverly Ann, 3,916,539.

Pankin, Jerome; and Feldman, Beverly Ann, to Pankin International Ltd. Shoe construction. 3,916,539, Cl. 36-51.000.

Pankow, Bernd: *See*—
Crawford, James Darwin; and Pankow, Bernd, 3,916,944.

Paoli, Stephen A. Mechanical separator machine rotor and method of making same. 3,917,180, Cl. 241-293.000.

Pape, Hermann, to Gardisette Holding AG. Device for packing, transporting and storing ready-made curtains or drapes. 3,917,065, Cl. 206-326.000.

Papp, Gyula: *See*—
Takacs, Kalman; Szekeres, Laszlo; Harsanyi, Kalman; Papp, Gyula; Neszmelyi, Andras; and Benedek, Eva, 3,917,610.

Pappas, Michael J.: *See*—
Buechel, Frederick F.; and Pappas, Michael J., 3,916,451.

Paquette, Marcel. S-shaped throwing objects and horizontal target. 3,917,269, Cl. 273-95.00R.

Parekh, Girish Girdhar; and Blank, Werner Josef, to American Cyanamid Company. Process for the preparation of water emulsifiable anionic resins and the resins thus produced. 3,917,573, Cl. 260-78.50T.

Parker, Howard W.; and Sangster, Arlon G., to Jamesbury Corporation. Hinge and detent mechanism. 3,916,479, Cl. 16-142.000.

Parker, Rollin James, to General Electric Company. Loudspeaker. 3,917,914, Cl. 179-115.00R.

Parks, John H.: *See*—
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Parrish, Donald B.: *See*—
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Pars, Harry George: *See*—
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Parthasarathy, R.; and Maselli, James Michael, to W. R. Grace & Co. Paraffin hydroisomerization process. 3,917,739, Cl. 260-683.650.

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Pascente, Joseph E., to Grigsby-Barton, Inc. Synchronous switching circuit. 3,917,962, Cl. 307-252.0UA.

Pasero, Edoardo: *See*—
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Passalenti, Beppino: *See*—
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Patrick J. McGannon and Gloria J. McGannon: *See*—
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Patten, Michael Allen, to International Business Machines Corporation. Telephone calling signal translating circuitry. 3,917,913, Cl. 179-84.0VF.

Pauliukonis, Richard S. Energy conserving tandem directional valve. 3,916,952, Cl. 137-625.640.

Pavena AG: *See*—
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Pawson, Beverly Ann; and Saucy, Gabriel, to Hoffmann-La Roche Inc. Juvabione and derivatives thereof. 3,917,652, Cl. 260-340.900.

Payne, James U., to Magna Motor, Inc. Selectively variable timing means for a brushless electric motor. 3,917,988, Cl. 318-138.000.

Payson, Buford L., to Strauss, Robert E. Carpet stretcher improvements. 3,917,225, Cl. 254-60.000.

Pearce, Derek Roger; Davis, Benjamin; Pearce, Derek Roger; and Connor, Paul, to Glaxo Laboratories Limited. Steroidal anaesthetic composition for intraveneous injection. 3,917,830, Cl. 424-243.000.

Pearce, Derek Roger: *See*—
Pearce, Derek Roger; Davis, Benjamin; Pearce, Derek Roger; and Connor, Paul, 3,917,830.

Pearce, Larry N.; Lacy, C. Lyle; and Neumann, Arthur E., to Cotton Incorporated. Liquid atomizing method and apparatus. 3,917,167, Cl. 239-4.000.

Pearlstein, Fred; and Weightman, Robert F., to United States of America, Army. Electroless deposition of cobalt boron. 3,917,464, Cl. 29-196.600.

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Pearne, Frank S.; Pearne, Florentin J.; Osborn, William P.; King, Terance M.; and Guzzetta, Joseph A., to Aircraft Mechanics, Inc. Brick handling system. 3,917,081, Cl. 214-6.00A.

Pearson, Leonard Charles; and Jehu, Victor James, to National Research Development Corporation. Vehicle and safety device for same. 3,917,019, Cl. 180-82.00C.

Pease, William C., III: *See*—
Van Doorn, Donald W.; Colquett, Jack L.; Hawkins, James B.; Pease, William C., III; and Webb, Tommy W., 3,916,778.

Pech, Gunther: *See*—
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Peddinghaus, Carl Ulrich. Load-bearing compression leg. 3,917,244, Cl. 267-34.000.

Pedersen, Arne Martinus, to A/S Alfred Benzon. Oral drug preparations. 3,917,813, Cl. 424-20.000.

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Pehoski, Walter L.: *See—*
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Pekrul, Ronald G.; Stegmaier, Louis T.; and Mrowka, Joseph J., to General Electric Company. Manually operated rotary switch and combination load contact-fuse clip therefor. 3,917,920, Cl. 200-162.000.
Pelczarski, Eugene A.; Karnavas, James A.; and La Rosa, Paul J., to Black Sivalls & Bryson, Inc. Method of treating coal refuse. 3,917,795, Cl. 423-168.000.
Pellegrini, Francesco: *See—*
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Pennings, Pieter; and Scholler, Gerhard, to Orenstein & Koppel AG. Unloading device with a vertical conveyor. 3,917,051, Cl. 198-91.000.
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Pennwalt Corporation: *See—*
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Haszeldine, Robert Neville; and Rowland, Ronald, 3,917,725.
MacLeay, Ronald Edward; and Sheppard, Chester Stephen, 3,917,744.
Turney, George Holbrook, 3,917,822.
Perdijon, Jean, to Commissariat a l'Energie Atomique. Deflector for converting a beam of parallel rays into a beam of rays having constant incidence on cylindrical part. 3,916,675, Cl. 73-67.80R.
Perkin-Elmer Corporation, The: *See—*
Siegler, E. Horace, Jr., 3,917,406.
Perrin, Richard. Intraluminal vein holder. 3,916,874, Cl. 128-1.00R.
Perry, Charles B.: *See—*
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Perry, Louis W., Jr.: *See—*
Fisher, Colin R.; and Perry, Louis W., Jr., 3,917,509.
Persson, Nils Christer, to Inventor AB OPE. Container for the mouldering of organic waste. 3,916,456, Cl. 4-131.000.
Pesola, Roger. Electric finger nail file. 3,916,921, Cl. 132-73.600.
Pestka, John A., to Illinois Tool Works Inc. Drive fastener for insertion into sheet material. 3,916,755, Cl. 85-5.00R.
Peterson, George, to Bunker Ramo Corporation. Coupling ring assembly. 3,917,373, Cl. 339-89.00R.
Peterson, Jeffery D.: *See—*
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Peterson, Marvin A.: *See—*
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Peterson, Wendell C. Spreader instrument for use in performing a spinal fusion. 3,916,907, Cl. 128-345.000.
Peterson, William Carl: *See—*
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Petracek, Francis J., to Riku Laboratories, Inc. Anti-inflammatory substituted benzofuran. 3,917,654, Cl. 260-346.20R.
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Petrosky, Willard L.: *See—*
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Petrotek, Inc.: *See—*
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Petzetakis, Aristovoulos George, deceased; Diapouli, Irene H., administrator; Petzetakis, Nikolas G., administrator; and Petzetakis, Menelaos G., administrator. Method for the production of hollow bodies, especially large-diameter ducts from thermoplastic synthetic resin. 3,917,500, Cl. 156-195.000.
Petzetakis, Menelaos G., administrator: *See—*
Petzetakis, Aristovoulos George, deceased; Diapouli, Irene H., administrator; Petzetakis, Nikolas G., administrator; and Petzetakis, Menelaos G., administrator, 3,917,500.
Petzetakis, Nikolas G., administrator: *See—*
Petzetakis, Aristovoulos George, deceased; Diapouli, Irene H., administrator; Petzetakis, Nikolas G., administrator; and Petzetakis, Menelaos G., administrator, 3,917,500.
Peuzin, Jean Claude, to Commissariat a l'Energie Atomique; and Agence Nationale de Valorisation de la Recherche Anvar. Method and device for providing a variable delay line. 3,918,012, Cl. 333-30.00R.
Pfannmueller, Helmut: *See—*
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Althuis, Thomas H., 3,917,645.
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Bass, Robert J.; Koch, Richard C.; Richards, Hugh C.; and Thorpe, John E., 3,917,838.
Phelps, Peter M. Sloped film fill assembly cooling tower. 3,917,764, Cl. 261-111.000.
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Seefluth, Charles L., 3,917,095.
Smith, Ernest L., 3,917,157.
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Phoenix Corporation: *See—*
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Pichard, Paul; and Corbin, Lucien, to ETAT FRANCAIS. Cartridge clip and a machine for filling the clip with cartridges. 3,916,552, Cl. 42-87.000.
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Picmaus, Ernst; and Bach, Bernhard, to Klein. Schanzlin & Becker Aktiengesellschaft. Bistable regulator having positive and negative feedback. 3,917,993, Cl. 323-75.00N.
Pieczko, George: *See—*
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Pieper, Rudolf: *See—*
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Pierre, Bernard; Volle, Rene; and Simon, Georges, to Etat Francais. Twin feed ammunition conveyor for feeding shells to an automatic weapon. 3,916,762, Cl. 89-33.0SF.
Pierson, Robert M.: *See—*
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Pies, Othmar W. Magnetic marker assembly. 3,916,821, Cl. 116-114.00R.
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Fujiki, Masaru; Yoshida, Masahiro; and Fukuda, Hiroshi, 3,917,329.
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Piret, Jean, to Regie Nationale des Usines RENAULT; and Automobiles PEUGEOT. Vehicle transmissions. 3,916,727, Cl. 74-688.000.
Pirrie, Norman Duncan; and Bland, John, to Sir Robert McAlpine & Sons Limited. Tunnelling machines. 3,917,351, Cl. 299-90.000.
Pisanchyn, John: *See—*
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Pitney-Bowes, Inc.: *See—*
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Montagnino, James G., 3,917,090.
Zucker, Fredric E.; Storace, Anthony; and Sette, Paul R., 3,917,012.
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Plastic Techniques, Inc.: *See—*
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Platt International Limited: *See—*
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Plessey Company Limited, The: *See—*
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Plockinger, Erwin; and Kuhnelt, Gert, to Vereinigte Edelstahlwerke AG. Process for making metal ingots. 3,916,978, Cl. 164-52.000.
Ploner, Klaus-Jurgen, to Givaudon Corporation. Process for making 1,3,6-octatrienes by dimerization. 3,917,735, Cl. 260-677.00R.
Plotsky, Norman, to Sundstrand Corporation. Positive expulsion fuel tank, and bladder dispenser therefor. 3,917,117, Cl. 222-94.000.
Plough, Russell H., to Symons Corporation. Articulated concrete column form with novel corner fastening device. 3,917,216, Cl. 249-48.000.
Pneumatiques, Caoutchouc Manufacture et Plastiques Kleber-Colombes: *See—*
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Poche, John M. Pivotable bucket with rotatable shredder blade and earth ejector. 3,916,543, Cl. 37-93.000.
Poclain: *See—*
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Stoufflet, Rene G., 3,917,016.
Poehlmann, Paul W., to H. Koch & Sons, Inc. Adjustable tiedown device. 3,917,213, Cl. 248-509.000.

Poignant, Jean-Claude: *See—*
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Pointer, Floyd E.: *See—*
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Polak, Zednek, to Nicoll, Frank S., Jr.; and Polak, Zednek, a part interest to each. Gas filtration system employing a filtration screen of particulate solids. 3,917,458, Cl. 23-262.000.
Polaroid Corporation: *See—*
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Pond, C. Ray; Robinson, Lawrence W.; and Texeira, Patrick D., to Boeing Company, The. Apparatus suitable for use in orienting aircraft flight for refueling or other purposes. 3,917,196, Cl. 244-77.00R.
Pond, David M.; and Thweatt, John G., to Eastman Kodak Company. Preparation of phytone via the addition of dimethylketene to 4,8-dimethyl-12-oxotridecanal. 3,917,710, Cl. 260-593.00R.
Pont-A-Mousson S.A.: *See—*
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Porret, Daniel; and Habermeier, Jurgen, to Ciba-Geigy Corporation. N-halogenooxaalkyl derivatives of hydantoins. 3,917,637, Cl. 260-309.500.
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Walraven, Anthonie; Koorneef, Jacob; and Potgiesse, Jan Antoon Ludolf, 3,918,091.
Potoski, John R.; and Freed, Meier E., to American Home Products Corporation. 5,6,7,8,9,10-Hexahydro-5-phenyl-5,9-methanobenzocycloocten-11-amines and related compounds. 3,917,680, Cl. 260-571.000.
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Pruett, Roy L.; and Smith, James A., to Union Carbide Corporation. Hydroformylation of unsaturated organic compounds. 3,917,661, Cl. 260-410.90R.
Prumm, Georg J. Electronic coin tester. 3,916,922, Cl. 133-3.00R.
Prunier, Louis, to American Optical Corporation. Lens surfacing apparatus. 3,916,574, Cl. 51-124.00L.
Puerner, George O., to P. R. Mallory & Co. Inc. Control device with axially aligned, independently rotatable variable resistors. 3,918,022, Cl. 338-134.000.
Puleo, Guiseppe, to Fiat Societa Per Azioni. Vehicle fenders of resilient material. 3,917,332, Cl. 293-63.000.
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Pumpenfabrik Urach: *See—*
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Purves, Edward Robert; and Snively, Charles Oscar, to Procter & Gamble Company, The. Decreasing the retrograded starch level and increasing the rehydration rate of dehydrated potato granules. 3,917,866, Cl. 426-457.000.
Pye Ltd.: *See—*
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Kumar, Surinder; and Ramachandran, Kolar S., 3,917,878.
Kumar, Surinder; and Ramachandran, Kolar S., 3,917,879.
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Radcliffe, Stanley L.; and Dornan, Arthur E., to Massey-Ferguson Inc. Transmission controlled vehicle brake. 3,917,040, Cl. 192-4.00A.
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Kletschka, Harold D.; and Rafferty, Edson H., 3,916,909.
Ralston Purina Company: *See—*
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Ramsey, Robert E.: *See—*
VandenBerg, Willard J.; Ramsey, Robert E.; Boilman, Robert L.; Krackenberger, Richard E.; and Pieczko, George, 3,917,055.
Ramun, Michael. Metal cutting tool. 3,916,520, Cl. 30-277.000.
Rana, Victoriano F.: *See—*
Harder, Donald C.; and Rana, Victoriano F., 3,917,252.
Randmae, Rein S.: *See—*
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Rao, Ramachandra A.: *See—*
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Rapp, Harold: *See—*
Towne, Herbert; and Rapp, Harold, 3,918,053.
Rasovich, Ivan. Portable cryogenic fluid immersion-type freezer. 3,916,640, Cl. 62-266.000.
Ratcliff, Felix E.; and Walinsky, Pierce J., to Waco Scaffold & Shoring Co. Flying form. 3,917,214, Cl. 249-18.000.
Rath, Heinrich Bernard; and Klassen, Horst Willi, to Girling Limited. Sliding caliper disc brakes. 3,917,033, Cl. 188-73.300.
Raval, Gaston, to OMEGA Louis Brandt & Frere S.A. Transmission device for a horological mechanism. 3,917,965, Cl. 310-21.000.
Ray-Chaudhuri, Dilip K.; and Iovine, Carmine P., to National Starch and Chemical Corporation. Perfluoro alkyl sulfonamides useful as water and oil repellency agents. 3,917,691, Cl. 260-556.00F.
Raychem Corporation: *See—*
Meadows, John, 3,916,733.
Raymond Lee Organization, The: *See—*
Wolfe, William P., 3,916,868.
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Brown, Robert R., Jr., 3,917,234.
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Savage, David K., 3,918,078.
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Collins, John D., 3,918,054.
Razdan, Raj Kumar; and Pars, Harry George, to Sharps Associates. 1-[2,6-Dihydroxy-4-hydrocarbyl-benzoyl]polymethyleneimines and derivatives. 3,917,617, Cl. 260-293.770.
RCA Corporation: *See—*
Carlson, David J., 3,917,964.
Clark, Robert John, 3,918,039.
del Rio, Eddy Humberto, 3,917,925.
Gale, Michael Thomas, 3,917,378.

Taylor, Byron Kent; and Carlin, William Henry, 3,917,903.
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Weisbrod, Sherman, 3,917,980.
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Reader, Wayne T. Method and apparatus for measuring the cross-correlation of two dynamic mechanical quantities. 3,917,936, Cl. 235-181.000.
Reber, Walter, to Kuhn S.A. Gear box carrying rotary scythe mower rotors driven from underneath. 3,916,725, Cl. 74-606.00R.
Reed International Limited: *See*—
Attenburrow, David J., 3,916,884.
Reed, L. J., to Motorola, Inc. Current switch emitter follower master-slave flip-flop. 3,917,961, Cl. 307-243.000.
Reed, Richard S.; and Glueck, Alan R., to Catalox Corporation. Removal of contaminants from gaseous streams. 3,917,797, Cl. 423-210.500.
Reed Tool Company: *See*—
Murdoch, Henry W., 3,917,361.
Reflex Corporation of Canada Limited: *See*—
Hedgewick, Peter, 3,917,096.
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De Rosa, Daniel, 3,917,023.
Piret, Jean, 3,916,727.
Regnier, Gilbert; Canevari, Roger; Laubie, Michel; and Poignant, Jean-Claude, to Science-Union Et Cie. Benzodioxole compounds. 3,917,597, Cl. 260-256.40N.
Reich, Marvin: *See*—
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Reichel, Richard C.: *See*—
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Reifsteck, Robert L.: *See*—
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Reinhart, Tom R., to Baylor Company. Systems and methods for solving simultaneous equation. 3,917,929, Cl. 235-150.200.
Reinink, Arend, to Shell Oil Company. Chlorination of 3-oxoalkanamides. 3,917,694, Cl. 260-561.00K.
Reinke, Elmer E. Propelling pipe support tower for pivot irrigation systems. 3,917,171, Cl. 239-177.000.
Reinke, Robert V.; Newton, John E.; and Reifsteck, Robert L., to Eastman Kodak Company. Distortion correction apparatus for electro-optical reflectors which scan beams to produce images. 3,918,068, Cl. 354-17.000.
Reinker, Joseph F., Jr.: *See*—
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Reinwall, Ernest William, Jr.; Soltysik, Edmund J.; and Lindeman, Richard Jay, to Illinois Tool Works Inc. Terminal block mounting bracket. 3,917,202, Cl. 248-68.00R.
Reisdorf, Daniel: *See*—
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Repetti, Renato, to Ing. C. Olivetti & C., S.p.A. Collapsible container. 3,917,102, Cl. 220-4.00F.
Research Corporation: *See*—
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Voigt, Walter; and Hsia, Sung Lan, 3,917,829.
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Resource Sciences, Corporation: *See*—
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Reynolds, Frank N., to Poultry Transaire Systems, Inc. Poultry conveying system. 3,916,835, Cl. 119-12.000.
Rhinehart, Paul E. Vehicle recycling plant. 3,917,239, Cl. 266-16.000.
Rhodia, Inc.: *See*—
Gradeff, Peter S.; and Bertrand, Claude, 3,917,713.
Rhone-Poulenc Industries: *See*—
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Rhone-Poulenc S.A.: *See*—
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Michel, Max, 3,917,544.
Ribich, William A.; and Russell, David B., to American Velcro, Inc. Fastener. 3,916,703, Cl. 24-73.00P.
Riccio, Edward W. Driver education teaching and testing device. 3,916,534, Cl. 35-11.000.
Rice, Ronald B.; and Uhl, John P., to Illinois Tool Works Inc. Metallized wound capacitor with edge metallization. 3,917,986, Cl. 317-260.000.
Rice, Warren Wesley, to Du Pont de Nemours, E. I., and Company. Apparatus for mixing gas and liquid. 3,917,756, Cl. 261-18.00B.
Richard Heinze GmbH & Co. KG, Firma: *See*—
Pittasch, Willi, 3,916,481.
Richards, Gerald F.; and Blake, Nathan L., to Avco Corporation. Forage harvester with improved flow pattern for cut material. 3,916,605, Cl. 56-13.300.
Richards, Hugh C.: *See*—
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Grunwell, Joyce F.; Benson, Harvey D.; and Petrow, Vladimir, 3,917,831.
Riches, George Henry. Mechanism for converting a couch into an upper and lower bed. 3,916,462, Cl. 5-9.00R.
Richmond, Henry, to American Cyanamid Company. Bis(alkylsulfonyl)vinylbenzenes. 3,917,714, Cl. 260-607.00A.
Richt, Oskar Hubert, to Uher Werke Munchen. Transport mechanism for magnetic-tape devices, especially magnetic tape cassette devices. 3,917,190, Cl. 242-191.000.
Richter, Donald L., to Temcor. Dome construction and drainage system therefor. 3,916,589, Cl. 52-81.000.
Richter, George N.; Slater, William L.; Child, Edward T.; and Ahlborn, John C., to Texaco Inc. Recovery of carbon from synthesis gas. 3,917,569, Cl. 210-21.000.
Richter, Sidney B.; and Kaplan, Ephraim H., to Velsicol Chemical Corporation. 1-Halo-2-alkoxyimino-2-alkoxy ethane compounds. 3,917,664, Cl. 260-453.00R.
Richter, Sidney B.; and Levin, Alfred A. Fungicidal compositions and methods of combatting fungi using substituted isoindolines. 3,917,843, Cl. 424-274.000.
Rickrode, Jack A.: *See*—
Frame, Charles W.; and Rickrode, Jack A., 3,916,499.
Ricoh Co., Ltd.: *See*—
Kato, Saburo; and Yamada, Isao, 3,918,089.
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Ridgway, Heulwen Moira: *See*—
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Rieckmann, Peter: *See*—
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Rieth, James E.: *See*—
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Rikagaku Kenkyusho: *See*—
Hashimoto, Tohru; Kawarada, Akira; and Tamura, Sachiko, 3,917,477.
Riku Laboratories, Inc.: *See*—
Petracek, Francis J., 3,917,654.
Riley, Arthur F., to Teletype Corporation. Synchronized line feed tensioning and gripping apparatus for printer. 3,917,048, Cl. 197-133.00P.
Ringprism Pty. Limited: *See*—
Eckstein, Victor, 3,917,388.
Rinio, Johannes Augustus. Cable hauling device. 3,916,487, Cl. 24-122.600.
Ripka, Josef: *See*—
Doudlebsky, Ctibor; Jaros, Frantisek; Cap, Antonin; Ferka, Frantisek; Ripka, Josef; and Junek, Jan, 3,916,485.
Rishel, Richard A.: *See*—
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Rissi, Erwin: *See*—
Hugi, Bruno; Rentsch, Gunter; and Rissi, Erwin, 3,917,623.
Ritchey, Eugene B. Tag inserting tool. 3,916,904, Cl. 128-330.000.
Rittersdorf, Walter; Guthlein, Werner; Rey, Hans-Georg; and Rieckmann, Peter, to Boehringer Mannheim GmbH. Diagnostic agent for the detection of peroxidatively active substances. 3,917,452, Cl. 23-230.00B.
Rivas, Raul Benavides. Sanding cylinder for drills. 3,916,586, Cl. 51-368.000.
Rivers, Roy W., to Xerox Corporation. Digital to analog converter. 3,918,046, Cl. 340-347.0DA.
Rix, Albert; Fuchs, Hans; Moritz, Rolf; and Ubben, Erhard, to Olympia Werke AG. Fine-toothed gear pair consisting of synthetic material. 3,916,716, Cl. 74-461.000.
Robert, Andre, to Upjohn Company, The. Method of reducing the undesirable gastraintestinal effects of prostaglandin synthetase inhibitors. 3,917,828, Cl. 424-234.000.
Robert Bosch GmbH: *See*—
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Fauser, Edwin; Schirmer, Gunter; Steinke, Leo; and Hellberg, Rainer, 3,916,855.
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Knapp, Heinrich; and Schwartz, Reinhard, 3,916,842.
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Robertson, William Ernest: *See—*
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Robinson, Frank: *See—*
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Robinson, Ivan B., to Kaiser Aluminum & Chemical Corporation. Vacuum brazing process. 3,917,151, Cl. 228-220.000.

Robinson, Lawrence W.: *See—*
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Robinson, McDonald, to Bell Telephone Laboratories, Incorporated. Chemical vapor deposition reactor. 3,916,822, Cl. 118-49.000.

Robinson, Terrence J., to G. D. Searle & Co. Administration of medicaments and the like. 3,916,898, Cl. 128-260.000.

Robinson, Thomas C.: *See—*
Buck, Keith E.; Kitrilakis, Sotiris; and Robinson, Thomas C., 3,916,888.

Robison, Russell O.; and Fender, Malvin L., to Rockwell International Corporation. Electric motor armature construction. 3,917,967, Cl. 310-42.000.

Roccaforte, Harry L., to Hoerner Waldorf Corporation. Tube display carton. 3,917,064, Cl. 206-277.000.

Rockford Automation, Inc.: *See—*
Block, Bruce E.; and Samuelson, Philip H., 3,916,797.

Rockwell International Corporation: *See—*
Caswell, Robert L., 3,917,385.
Dorsman, Adrian K., 3,918,050.
Heinz, David M.; and Stearns, Frederick S., 3,917,125.
McKenzie, Donald E.; Birk, James R.; Yosim, Samuel J.; and Huber, Donald A., 3,916,617.
Robison, Russell O.; and Fender, Malvin L., 3,917,967.

Rodaway, Keith S., to Everst & Jennings, Inc. Indoor/outdoor wheelchair frame. 3,917,312, Cl. 280-242.0WC.

Rodek, Victor; Merritt, Lauren V.; and Luzio, Guillermo F., to Xerox Corporation. Method and apparatus for maintaining a predetermined phase relationship between two signals. 3,917,400, Cl. 355-50.000.

Rodemann, Alfred H.: *See—*
Mohon, Windell N.; Breglia, Denis R.; and Rodemann, Alfred H., 3,916,536.

Rodgers, Otis Ned, to Smith International, Inc. Box hole drill steel. 3,917,321, Cl. 285-115.000.

Rodgers, Otis Ned: *See—*
Kloesel, Joseph A., Jr.; and Rodgers, Otis Ned, 3,917,319.

Rodriguez, Manuel J. Check printing device. 3,916,788, Cl. 101-102.000.

Roe, Michael James: *See—*
Stansfield, Fred; and Roe, Michael James, 3,917,224.

Roelofs, Wendell L.; Hill, Ada S.; Baker, Thomas C.; and Carde, Ring T., to Research Corporation. Novel attractant components for males of the tobacco budworm moth. 3,917,711, Cl. 260-601.00R.

Roesch, Androniki: *See—*
Winter, Werner; Thiel, Max; Stach, Kurt; Schaumann, Wolfgang; and Roesch, Androniki, 3,917,596.

Rogers, John E., to Memorial Hospital Medical Center of Long Beach. Preformed self-conforming drop foot brace. 3,916,886, Cl. 128-80.00E.

Rogers, Leslie Richard: *See—*
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Roggensack, Richard L., to Addmaster Corporation. Printing platen. 3,916,787, Cl. 101-93.410.

Rohmiller, Harvey William: *See—*
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Rohr Industries, Inc.: *See—*
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Roland Offsetmaschinenfabrik Faber & Schleicher AG: *See—*
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Rolar, Inc.: *See—*
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Roll, Guy, to Ehrenreich Photo Optical Industries, Inc. Vibration isolated table with improved mounts. 3,917,201, Cl. 248-20.000.

Rolls-Royce (1971) Limited: *See—*
Ferguson, John Gilbert; and Waters, Geoffrey Dallinger, 3,917,150.

Romer, Thomas R.: *See—*
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Rondo Machine Corporation: *See—*
Wood, Dennis E., 3,917,448.

Rose, James J.; and Horton, Edward L., to Enviro-Blast International. Sandblast machine. 3,916,568, Cl. 51-8.00R.

Rose, John Brewster: *See—*
Leslie, Victor Jeffrey; and Rose, John Brewster, 3,917,715.

Rose, Willis Earl, to Dresser Industries, Inc. Multi-stage regenerative fluid pump. 3,917,431, Cl. 415-53.00T.

Rosensweig, Ronald E., to Ferrofluidics Corporation. Ferrofluid compositions and process of making same. 3,917,538, Cl. 252-62.510.

Rosi, David: *See—*
Archer, Sydney; and Rosi, David, 3,917,703.

Ross, Stephen T.: *See—*
Kaiser, Carl; and Ross, Stephen T., 3,917,704.
Kaiser, Carl; and Ross, Stephen T., 3,917,847.

Rossi, Joseph M. Engine having reciprocating piston and rotary piston. 3,916,866, Cl. 123-197.00R.

Rossitto, Vincent J.; Baker, Robert E.; Jarvis, James J.; and De Serio, James N., to Metal-Cladding, Inc. Tank construction. 3,917,104, Cl. 220-18.000.

Rotch, Abbott L., to Raymond Lee Organization, Inc., The, a part interest. Controlled circuit breaker unit. 3,918,015, Cl. 335-145.000.

Roth, Howard: *See—*
Kaufman, Harold B., Jr.; Roth, Howard; and McCarthy, John P., 3,917,863.

Rothe, Werner: *See—*
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Rouaud, Christian: *See—*
Abbes, Claude; Fages, Jean; Mengus, Georges; Rouaud, Christian; and de Villepoix, Raymond, 3,917,294.

Rowe International, Inc.: *See—*
Okkonen, Oliver G.; and Herring, Lloyd D., 3,917,260.

Rowland-Hill, Edward W., to Sperry Rand Corporation. Axial flow combine. 3,916,912, Cl. 130-27.00T.

Rowland, Ronald: *See—*
Haszeldine, Robert Neville; and Rowland, Ronald, 3,917,725.

Rowse, Robert A.; and Lakhani, Hussain G., to Norton Company. Cut-off wheels of fused alumina-zirconia alloy abrasive grains. 3,916,583, Cl. 51-298.000.

Royle, James Kenneth Davenport: *See—*
Paget, Hugh Patrick Dryhurst; Rogers, Leslie Richard; Royle, James Kenneth Davenport; Stansfield, James Frederick; and Topham, Arthur, 3,917,639.

Rudd, Adrian Francis. Teaching device employing magnetic tape with legends and contained in a special cassette. 3,918,094, Cl. 360-96.000.

Rueger, William J., to International Business Machines Corporation. Push-threading tape in a helical path. 3,918,092, Cl. 360-85.000.

Ruffatti, Robert: *See—*
Ghosh, Suhas; and Ruffatti, Robert, 3,917,916.

Ruhe, Anthony; Steel, Robert R.; and Varney, John W., to Foster Wheeler Corporation. Gas turbine regenerator. 3,916,990, Cl. 165-158.000.

Rundell, Herbert A., to Texaco Inc. Method and apparatus for developing a surface well-drilling log. 3,916,684, Cl. 73-151.500.

Runnels, Joe Neal, Jr., to Boeing Company, The. Boundary layer control and anti-icing apparatus for an aircraft wing. 3,917,193, Cl. 244-42.0CC.

Runyon, Larry K., to Techway, Inc. Rooting matrix system. 3,916,565, Cl. 47-58.000.

Runyon, Robert C., to Technical Devices, Inc. Welding tip. 3,917,148, Cl. 228-54.000.

Rupp, Georges: *See—*
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Russell, David B.: *See—*
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Russell, George K., to Sandoz, Inc. Patient ventilator apparatus. 3,916,889, Cl. 128-145.800.

Ruti Machinery Works Ltd.: *See—*
Keldany, Rachid, 3,916,935.

Ryan, Vincent J., to University of California, The Regents of the. Book indexing and processing system. 3,917,317, Cl. 283-42.000.

Ryckman, George E.; and Budd, Walter J., to Uniroyal, Inc. Tensile testing apparatus. 3,916,681, Cl. 73-103.000.

Ryder, Francis E., to Memo-Chek, Inc. Visual reminder device. 3,916,547, Cl. 40-104.020.

S. A Francois Salomon & Fils: *See—*
Salomon, Georges Pierre Joseph, 3,917,300.

S & F DeLise Realty Corporation: *See—*
De Lise, Stephen W.; and De Lise, Frank C., 3,917,251.

Saab, Amin Melhem. Vehicle safety apparatus. 3,917,020, Cl. 180-93.000.

Sach, George Sidney: *See—*
Lee, Richard Martin; and Sach, George Sidney, 3,917,625.

Sachs, Martin S.: *See—*
Schrier, Michael Robert; and Eichner, Jack Michael, 3,917,265.

Saeva, Franklin D.; and Schank, Richard L., to Xerox Corporation. Liquid crystal compositions between electrodes, one of which is a photoconductor. 3,917,481, Cl. 96-1.00R.

Safeway Stores, Incorporated: *See—*
Comstock, Alfred E.; and Wilcox, Burdsal, 3,916,741.
Lopez, Albert; and Adams, James, 3,916,498.

Sagane, Norio; Morimoto, Toru; and Okagawa, Fumihiko, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Continuous process for preparing a shaped article of a foamed resin reinforced by fibres. 3,917,774, Cl. 264-46.200.

Sailer, Heinrich; Schatz, Norbert; and Schollmeier, Gero, to Siemens Aktiengesellschaft. Apparatus for producing two Hilbert Transform related signals. 3,918,001, Cl. 325-137.000.

Sain, William H.: *See—*
Needle, Jules S.; and Sain, William H., 3,917,973.

St-Laurent, Andre: *See—*
Johnston, John S.; and St-Laurent, Andre, 3,916,966.

Saita, Nobuo; and Tanaka, Yoichi, to Kabushiki Kaisha Yaskawa Denki Seisakusho. Generation of digital functions. 3,917,932, Cl. 235-152.000.

Saito, Akira: *See—*
Numakura, Toshihiko; Yamagiwa, Kazuo; and Saito, Akira, 3,918,085.

Saito, Sizuo: *See—*
Yasue, Masayuki; Saito, Sizuo; Shimojo, Sumio; and Shiode, Kazuhisa, 3,917,807.

Sakai, Masanori: *See—*
Nigorikawa, Tetsu; Sakai, Masanori; and Nakajima, Masayoshi, 3,917,130.

Sakai, Satoshi; Shimizu, Norio; Nomura, Junji; and Ueji, Norboru, to Matsushita Electric Works, Ltd. Outer blade for reciprocal type electric shaver. 3,916,522, Cl. 30-346.510.

Sakai, Yasunori: *See—*
Nagayoshi, Akio; Morii, Kenji; and Sakai, Yasunori, 3,916,953.

Sakakibara, Shigekado. Gas sealing device for internal combustion engine pistons. 3,917,133, Cl. 123-193.00P.

Sakurada, Ikuo: *See—*
Sema, Shunzo; and Sakurada, Ikuo, 3,917,945.

Sakurai, Yoshitoshi; and Ohata, Satoru, to Honda Giken Kogyo Kabushiki Kaisha. Intake mixture heating device for internal combustion engine. 3,916,852, Cl. 123-75.00B.

Sale Tilney AG: *See—*
Grenfell, Julian Pascoe, 3,917,123.

Salkeld, Larry A. Leg exercising apparatus. 3,917,262, Cl. 272-58.000.

Salminen, Aarne. Method of producing printed circuit cards in the form of multilayer prints. 3,916,514, Cl. 29-625.000.

Salomon, Georges Pierre Joseph, to S. A Francois Salomon & Fils. Ski binding. 3,917,300, Cl. 280-11.35R.

Salvade, Gennaro, to J. Bobst & Fils S.A. Stepped rear strap for bottom feed separators. 3,917,259, Cl. 271-133.000.

Salzberg, Edward. Broadband folded h-plane orthogonal tee. 3,918,011, Cl. 333-11.000.

Samuelson, Philip H.: *See—*
Block, Bruce E.; and Samuelson, Philip H., 3,916,797.

Sander, Gottfried, to Hermann Berstorff Maschinenbau GmbH. Method and apparatus for controlling continuous through-put of material on mixing rolls of a mill. 3,917,237, Cl. 259-188.000.

Sanders, Dennis E., to Rohr Industries, Inc. Overwing post exit blocker/deflector door thrust reverser. 3,917,198, Cl. 244-110.00B.

Sanderson, Robert A.: *See—*
Katz, Murray; Sanderson, Robert A.; and Hirschenhofer, John H., 3,917,520.

Sandoz, Inc.: *See—*
Galantay, Eugene E., 3,917,833.
Houlihan, William J., 3,917,634.
Russell, George K., 3,916,889.
Stiller, Frank P., 3,917,887.

Sandoz Ltd.: *See—*
Bitterli, Peter; and Kehrer, Fritz, 3,917,641.
Hugi, Bruno; Rentsch, Gunter; and Rissi, Erwin, 3,917,623.

Sands, Michael A.; and Marino, Santino Paul, to CPC International Inc. Non-hygroscopic, water-soluble fondant and glaze composition and process for preparing the same. 3,917,874, Cl. 426-572.000.

Sandvik Aktiebolag: *See—*
Backman, Anders Lars Erik; and Forsberg, Stig Gunnar, 3,917,492.

Sangster, Arlon G.: *See—*
Parker, Howard W.; and Sangster, Arlon G., 3,916,479.

Sangster, Frederik Leonard Johan, to U.S. Philips Corporation. Integrated semiconductor device employing charge storage and charge transport for memory or delay line. 3,918,081, Cl. 357-24.000.

Santilli, Arthur A.; and Scotese, Anthony C., to American Home Products Corporation. [(9-Oxoxanthene-2,6-diyl)dioxy]diacetic acid, diethyl ester, dihydrazides and derivatives thereof. 3,917,586, Cl. 260-240.100.

Santilli, Arthur A.; and Scotese, Anthony C., to American Home Products Corporation. ((9-Oxoxanthene-2,6-diyl)dioxy)diacetonitriles and diacetamidoxime. 3,917,650, Cl. 260-335.000.

Santora, Norman Julian: *See—*
Diamond, Julius; and Santora, Norman Julian, 3,917,846.

Sapir, Said, to International Telephone & Telegraph Corporation. Anti-skid brake control system and failsafe circuit therefor. 3,917,359, Cl. 303-21.0AF.

Sarishvili, Naskid Grigorievich: *See—*
Merzhanian, Artemy Arutjunovich; Brusilovsky, Sergei Alexeevich; Sarishvili, Naskid Grigorievich; Kishkovsky, Zbignev Nikolaevich; Bronshtein, Isaal Iosifovich; and Gagarin, Mikhail Alexeevich, 3,916,775.

Sarkes Tarzian, Inc.: *See—*
Valdettaro, Alarico A., 3,916,820.

Sartori, Rolland, to Rhone Poulenc Textile. Process and apparatus for transporting the yarn at high speed by means of a fluid under pressure. 3,917,141, Cl. 226-97.000.

Sasajima, Kikuo: *See—*
Maruyama, Isamu; Nakao, Masaru; Sasajima, Kikuo; Inaba, Shigeho; and Yamamoto, Hisao, 3,917,598.

Sasaki, Hiroo; Takemoto, Hisao; and Tago, Kazuo, to Toyo Soda Manufacturing Co., Ltd. Process for preparing ω-nitrocarboxylate. 3,917,660, Cl. 260-404.000.

Sato, Akira: *See—*
Nakagawa, Ryuichi; Yoshimatsu, Shiro; Fukuzawa, Akira; Sato, Akira; Mitsui, Tatsuro; Ueda, Takuya; and Ozaki, Tsuyoshi, 3,917,896.

Sato, Hiroshi; Takahashi, Hiroji; Kaneko, Takeshi; and Takemura, Toro, to Mitsubishi Rayon Company, Ltd. Process for producing carbon fiber. 3,917,776, Cl. 264-29.000.

Sato, Isao: *See—*
Masai, Tadahisa; and Sato, Isao, 3,916,619.

Sato, Kenji: *See—*
Takeshita, Kazuma; Sato, Kenji; and Shimazaki, Yasumi, 3,916,663.

Sato, Yutaka; Nakata, Yoshinori; Nishimori, Shoji; Nishii, Takeshi; Wakita, Masayasu; and Takeshita, Yoshimasa, to Matsushita Electric Works, Ltd. Method of making microswitches. 3,916,512, Cl. 29-622.000.

Satomi, Takeo; Hino, Naganori; Yoshida, Ryo; and Mukai, Kunio, to Sumitomo Chemical Company, Limited. Phosphorothionoamidates. 3,917,753, Cl. 260-954.000.

Saucy, Gabriel: *See—*
Pawson, Beverly Ann; and Saucy, Gabriel, 3,917,652.

Sauder, James W.; and Rishel, Richard A., to Vari-Temp Manufacturing Corporation. Portable cooling apparatus. 3,916,911, Cl. 128-400.000.

Saurai, Hisaya: *See—*
Aishima, Itsuho; Saurai, Hisaya; Kitaoka, Atsushi; and Katayama, Yoshihiko, 3,917,746.

Savage, David K., to Raymond Lee Organization, Inc., The, a part interest. Camera mat box. 3,918,078, Cl. 354-296.000.

Savonichev, Dmitry Nikolaevich: *See—*
Kabanov, Nikolai Pavlovich; Schukin, Vitaly Sergeevich; Makhalov, Sergei Fedorovich; Knyazev, Jury Alexeevich; Savonichev, Dmitry Nikolaevich; and Suvorov, Vladimir Nikolaevich, 3,917,139.

Sawai, Joe Y., to Ford Motor Company. Glass handling tongs. 3,917,336, Cl. 294-118.000.

Sawan, Anis S. Tool for use in removing automobile shock absorbers. 3,916,734, Cl. 81-56.000.

Saxena, Anil Kumar; Jain, Padam Chand; Singh, Gurbuksh; Dua, Prithvi Raj; Srimal, Rikhab Chand; Dhawan, Bhola Nath; and Anand, Nitya, to Council of Scientific and Industrial Research. 2-Substituted-1,2,3,4,6,7,12,12A-octahydropyrazino(2′,1′:6,1-)pyrido(3,4-B)indoles. 3,917,599, Cl. 260-268.0PC.

Sayce, Ian George; and Howie, Francis Henry, to National Research Development Corporation. Furnaces. 3,917,479, Cl. 75-10.00R.

Schafer, James P., to Werner, Frank D. Aerator. 3,917,763, Cl. 261-87.000.

Schafer, Wilbur C.: *See—*
Hakanson, Alton L.; and Schafer, Wilbur C., 3,917,027.

Schank, Richard L.: *See—*
Saeva, Franklin D.; and Schank, Richard L., 3,917,481.

Schatz, Clarence Henry: *See—*
Breyer, Walter Herman; Edelson, Nathan Allen; Gilliland, Barbara Faye; and Schatz, Clarence Henry, 3,916,900.

Schatz, Norbert: *See—*
Sailer, Heinrich; Schatz, Norbert; and Schollmeier, Gero, 3,918,001.

Schaumann, Wolfgang: *See—*
Winter, Werner; Thiel, Max; Stach, Kurt; Schaumann, Wolfgang; and Roesch, Androniki, 3,917,596.

Schellstede, Herman J.: *See—*
Bass, Samuel L., Jr.; and Schellstede, Herman J., 3,916,998.

Schempp, Eberhard G.: *See—*
Steffora, Theodore J.; and Schempp, Eberhard G., 3,917,241.

Schenker, Barry A.: *See—*
Franks, Charles R.; Schenker, Barry A.; and Kolb, James M., 3,917,518.

Schering Corporation: *See—*
Gold, Elijah H., 3,917,840.

Scheuerlein, Edwin Louis; and Starr, Frank Clyde, Jr., to Du Pont de Nemours, E. I., and Company. Process of making a porous polyimide shaped article. 3,917,761, Cl. 264-41.000.

Scheuneman, James H.; and Trost, John R., to Sperry Rand Corporation. Error logging in LSI memory storage units using FIFO memory of LSI shift registers. 3,917,933, Cl. 235-153.0AK.

Schierz, Winfried, to SEMIKRON Gesellschaft fur Gleichrichterbau und Elektronik m.b.H. Semiconductor rectifier arrangement. 3,918,084, Cl. 357-82.000.

Schirmer, Gunter: *See—*
Fauser, Edwin; Schirmer, Gunter; Steinke, Leo; and Hellberg, Rainer, 3,916,855.

Schlage, Ernest L., to Schlage Lock Company. Secret latch. 3,916,656, Cl. 70-148.000.

Schlage Lock Company: *See—*
Schlage, Ernest L., 3,916,656.

Schloemann Aktiengesellschaft: *See—*
Schmoll, Heinz; and Jenke, Dieter, 3,916,668.

Schlossbauer, Hubert: *See—*
Ludwig, Martin; Queisser, Rudolf; and Schlossbauer, Hubert, 3,918,090.

Schmid, Siegfried: *See—*
Neubrand, Paul; Glaser, Karl; Prater, Martin; and Schmid, Siegfried, 3,916,738.

Schmidt, A. Carl, to Weil-McLain Company, Inc. Air conditioning system. 3,916,638, Cl. 62-238.000.

Schmidt, Andreas, to Ciba-Geigy Corporation. Hydroxybenzoylalkanoic acid esters. 3,917,672, Cl. 260-473.00S.

Schmidt, Ernst; Ingestad, Sven Lennart; and Lindell, Sven Ewert, to AB Pygg-OCH Transportekonomi. Profile, such as the lift fork of a lifting device, and method of manufacturing same. 3,916,669, Cl. 72-379

Schmidt, Felix Helmut: *See—*
Weber, Helmut; Aumuller, Walter; Weyer, Rudi; Muth, Karl; and Schmidt, Felix Helmut, 3,917,690.

Schmidt, Hans-Joachim; Merkl, Ernst; and Lindae, Gerhard, to Robert Bosch GmbH. Sealed-beam headlight employing a halogen lamp. 3,917,939, Cl. 240-41.0SB.

Schmidt, Hans-Peter: *See—*
Suva, Tito R.; and Schmidt, Hans-Peter, 3,917,445.

Schmidt, Hans V. Elongate-material transport system. 3,917,078, Cl. 214-1.00P.

Schmidt, Harold Norbert: *See—*
Fitzpatrick, Joseph William; and Schmidt, Harold Norbert, 3,917,640.

Schmidt, Peter-Jurgen, to Robert Bosch GmbH. Automotive-type internal combustion engine exhaust gas emission control system. 3,916,848, Cl. 123-32.0EA.

Schmidt, Techniker Gerhard; Vinnermann, Antonius; and Bender, Rainer, to Franz Morat GmbH. Device for opening or closing latched needles of a knitting machine. 3,916,650, Cl. 66-111.000.

Schmitt, William C., to Milwaukee Faucets, Inc. Hot and cold water mixing valve. 3,916,951, Cl. 137-625.410.

Schmoll, Heinz; and Jenke, Dieter, to Schloemann Aktiengesellschaft. Sliding and locking the forging tools on a forging press. 3,916,668, Cl. 72-407.000.

Schmuck, Fredric E.: *See—*
Schoepe, Adolf; and Schmuck, Fredric E., 3,916,454.

Schneble, Frederick W., Jr., to Photocircuits Division of Kollmorgen Corporation. Immersion tin bath composition and process for using same. 3,917,486, Cl. 106-1.000.

Schneider, Cyril; and Hammond, Michael Douglas, to Miles Laboratories, Inc. Treatment of ethanol withdrawal symptoms with methergoline. 3,917,839, Cl. 424-261.000.

Schneider, Richard S.: *See—*
Soffer, Michael J.; and Schneider, Richard S., 3,917,582.

Schnitzler, Erwin; and Schnitzler, Ulrich, to E. Schnitzler GmbH & Co. Apparatus for coating fibers with binder to produce fiberboard. 3,916,825, Cl. 118-303.000.

Schnitzler, Ulrich: *See—*
Schnitzler, Erwin; and Schnitzler, Ulrich, 3,916,825.

Schoepe, Adolf; and Schmuck, Fredric E. Float for ball cocks and the like. 3,916,454, Cl. 4-56.000.

Scholler, Gerhard: *See—*
Pennings, Pieter; and Scholler, Gerhard, 3,917,051.

Schollmeier, Gero: *See—*
Sailer, Heinrich; Schatz, Norbert; and Schollmeier, Gero, 3,918,001.

Schott, Stuart: *See—*
Murib, Jawad H.; Schott, Stuart; and Bonecutter, Charles A., 3,917,809.

Schreyer, Gerd: *See—*
Beschke, Helmut; Kleemann, Axel; and Schreyer, Gerd, 3,917,542.

Schrier, Michael Robert; and Eichner, Jack Michael, to Schrier, Michael Robert; Eichner, Jack Michael; Sachs, Martin S.; and Reich, Marvin. Pneumatic ball ejecting machine. 3,917,265, Cl. 273-30.000.

Schroder, Heinz-Jurgen; and Berger, Wolfgang, to Siemens Aktiengesellschaft. Steam generator for a pressurized-water coolant nuclear reactor. 3,916,841, Cl. 122-32.000.

Schroeder, Herman Elbert; and Wolfe, James Richard, Jr., to Du Pont de Nemours, E. I., and Company. Copolyetherester blends. 3,917,743, Cl. 260-860.000.

Schroer, Wolfgang. Device for holding open the mouth. 3,916,880, Cl. 128-12.000.

Schudy, Fred Frank. Method and apparatus for orthodontic treatment. 3,916,526, Cl. 32-14.00A.

Schuierer, Manfred, to Bruckner Apparatebau GmbH. Methods of producing a polymer film on a fibre. 3,917,886, Cl. 427-342.000.

Schukin, Vitaly Sergeevich: *See—*
Kabanov, Nikolai Pavlovich; Schukin, Vitaly Sergeevich; Makhalov, Sergei Fedorovich; Knyazev, Jury Alexeevich; Savonichev, Dmitry Nikolaevich; and Suvorov, Vladimir Nikolaevich, 3,917,139.

Schulman, Hyman L.; Baron, Frank A.; and Weinberg, Alan E., to Mallinckrodt, Inc. Preparation of N-acetyl-p-aminophenol. 3,917,695, Cl. 260-562.00A.

Schulte, Klaus: *See—*
Breer, Karl; and Schulte, Klaus, 3,917,779.

Schulz, Waldemar, to Volkswagenwerk Aktiengesellschaft. Arrangement for setting the chamber of a pair of vehicle wheels. 3,917,308 Cl. 280-124.00B.

Schulze, Ehrhart. Apparatus for stacking and conveying sheet-like sections. 3,917,505, Cl. 156-515.000.

Schuppler, Emil; Ammazzalorso, Mario; Coldewey, Heiko; and Horst, Wilfried, to Justin Huppe, Firma. Venetian blind. 3,916,973, Cl. 160-178.00R.

Schur, George O. Thermally powered generating system employing a heat vapor bubble engine. 3,916,626, Cl. 60-496.000.

Schwan, Thomas J., to Morton-Norwich Products, Inc. 4-Methyl-α,2-diphenyl-5-pyrimidinemethanol. 3,917,595, Cl. 260-251.00R.

Schwartz, Reinhard: *See—*
Knapp, Heinrich; and Schwartz, Reinhard, 3,916,842.

Schwarz, Theodor: *See—*
Larenz, Joachim; Schwarz, Theodor; and Kobel, Erich, 3,917,120.

Schwarz, Wilfried: *See—*
Waldmann, Hans; Schwarz, Wilfried; Bergfeld, Manfred; Laupitz, Hans Joachim; Muller, Klaus; and Oleszko, Thaddeus J., 3,917,516.

Schweizer, Walter; and Reissland, Martin-Ulrich, to VDO Adolf Schindling AG. Apparatus for measuring the density of a liquid utilizing refraction. 3,917,411, Cl. 356-135.000.

Science-Union Et Cie: *See—*
Regnier, Gilbert; Canevari, Roger; Laubie, Michel; and Poignant, Jean-Claude, 3,917,597.

Scotese, Anthony C.: *See—*
Santilli, Arthur A.; and Scotese, Anthony C., 3,917,586.
Santilli, Arthur A.; and Scotese, Anthony C., 3,917,650.

Scott, Arthur A.: *See—*
Obermaier, Frank E.; and Scott, Arthur A., 3,917,163.

Scott, Eric J. Y.; and Smith, Robert L., to Mobil Oil Corporation. Process for manufacture of lubricating oil. 3,917,566, Cl. 208-293.000.

Scott Paper Company: *See—*
Breyer, Walter Herman; Edelson, Nathan Allen; Gilliland, Barbara Faye; and Schatz, Clarence Henry, 3,916,900.
Grant, Clyde P.; Look, Merton A.; and Lowe, Richard M., 3,916,827.
Gross, Frank C., 3,916,828.

Scott, Stephen Anthony: *See—*
Morser, Alfred Harold; Gibson, Roy; Scott, Stephen Anthony; Bailey, Clifford Michael; and Taylor, Ian Keith, 3,918,045.

Scovill Manufacturing Company: *See—*
Brown, Richard Edward, 3,916,929.

Scribner, Frank F.: *See—*
Looker, Olin L.; Johnson, Robert A.; Scribner, Frank F.; and Slates, Larry L., 3,916,913.

Scriven, Roger L.: *See—*
Chang, Wen-Hsuan; Scriven, Roger L.; and Prucnal, Paul J., 3,917,570.

Seale-Finch, Vernon, to Plessey Company Limited, The. Tape driving mechanism for tape recorders with solenoid operated clutch pulleys. 3,918,093, Cl. 360-96.000.

Seaton, George R.: *See—*
Kravitz, Bernard L.; and Seaton, George R., 3,918,083.

Sebag, Henri: *See—*
Vanlerberghe, Guy; and Sebag, Henri, 3,917,817.

Seefluth, Charles L., to Phillips Petroleum Company. Oriented article having bead attached by tapered stem. 3,917,095, Cl. 215-1.00C.

Seeling, Philip; and Brent, Burton David. Surgical instrument for plastic surgery. 3,916,910, Cl. 128-354.000.

Seidel, Harold, to Bell Telephone Laboratories, Inc. Combined feedback and feedforward automatic gain control. 3,918,003, Cl. 330-29.000.

Seidel, William B., to Babcock & Wilcox Company, The. Cam controlled machine tools with contour compensator. 3,916,571, Cl. 51-101.00R.

Seiler, Hartmut: *See—*
Conzelmann, Gerhard; and Seiler, Hartmut, 3,916,508.

Sekelsky, George. Hedge clipping catcher tray. 3,916,521, Cl. 30-132.000.

Sekisui Kagaku Kogyo Kabushiki Kaisha: *See—*
Sagane, Norio; Morimoto, Toru; and Okagawa, Fumihiko, 3,917,774.

Selinko, George J., to Motorola, Inc. Supporting and connecting structure for electric device. 3,917,372, Cl. 339-75.00M.

Sema, Shunzo; and Sakurada, Ikuo, to Hayashi, Katsuhiki. Method and apparatus for detecting the degree of contamination of waste water. 3,917,945, Cl. 250-301.000.

SEMIKRON Gesellschaft fur Gleichrichterbau und Elektronik m.b.H.: *See—*
Schierz, Winfried, 3,918,084.

Semperit AG: *See—*
Kratochvil, Egon; and Pech, Gunther, 3,917,791.

Sendner, Gerhard: *See—*
Muller, Hans Joachim; and Sendner, Gerhard, 3,916,724.

Serfling, Steven A. Aqueous crustacean culture system. 3,916,833, Cl. 119-2.000.

Servomed Arznei GmbH & Co Pharma KG: *See—*
Wawretschek, Helmuth, 3,917,836.

Sestanj, Kazimir: *See—*
Immer, Hans U.; Sestanj, Kazimir; Nelson, Verner R.; and Gotz, Manfred K., 3,917,578.
Immer, Hans U.; Sestanj, Kazimir; Nelson, Verner R.; and Gotz, Manfred K., 3,917,581.

Sette, Paul R.: *See—*
Zucker, Fredric E.; Storace, Anthony; and Sette, Paul R., 3,917,012.

Sevec, John B.; and Stein, Albert D., to United States of America, Energy Research and Development Administration. Adjustable extender for instrument module. 3,917,369, Cl. 312-333.000.

Sewell, Clinton J.; Frindell, Guy H.; Campagnuolo, Carl; and Vollbracht, Paul, to United States of America, Navy. Aircraft carried constant density munition dispensing system. 3,916,760, Cl. 89-1.50E.

Sexton, Robert L. Combined boat carrying and camping trailer. 3,917,086, Cl. 214-84.000.

Shafer, John L., to Occidental Petroleum Corporation. Process for the production of senarmontite by controlled hydrolysis of antimony trichloride. 3,917,793, Cl. 423-617.000.

Shaltiel, Shmuel, to Yeda Research & Development Co., Ltd. Hydrophobic chromatography. 3,917,527, Cl. 210-31.00C.

Shannon, John Martin, to U.S. Philips Corporation. Semiconductor devices. 3,918,070, Cl. 357-24.000.

Sharps Associates: *See—*
Razdan, Raj Kumar; and Pars, Harry George, 3,917,617.

Shaw, Charles W.: *See—*
Vannest, John T.; and Shaw, Charles W., 3,917,918.

Shaw, Edwin L.; and Brewer, Everett H., to Abex Corporation. Fluid translating device having expansible chambers. 3,916,931, Cl. 137-101.000.

Shaw, Herbert C.: *See—*
Bolton, Anthony P.; Best, Donald F.; and Shaw, Herbert C., 3,917,543.

Shaw, Philip E.; and Coleman, Richard L., to United States of America, Agriculture. Co-distillation method for recovering volatile flavor compounds from citrus essence oils. 3,917,865, Cl. 426-424.000.

Shaw, Thomas E., to C. L. Frost & Son, Inc. Mower drive shaft and pulley. 3,916,706, Cl. 74-230.010.

Sheahan, Desmond F.; and Callander, George C., to GTE Automatic Electric Laboratories Incorporated. Method of assembly of crystal filters. 3,916,490, Cl. 29-25.350.

Shell Oil Company: *See—*
Crossland, Ronald K.; and Harlan, James T., Jr., 3,917,607.
Harlan, James T., Jr., 3,917,742.
Reinink, Arend, 3,917,694.
Van den Berg, Godfried J.; and Ouwerschuur, Frank K. G., 3,917,468.
Verbrugge, Pieter A.; and Uurbanus, Elisabeth W., 3,917,667.

Shellberg, James E.: *See—*
Sisson, Ronald L.; and Shellberg, James E., 3,916,710.
Sisson, Ronald L.; and Shellberg, James E., 3,916,714.

Shema, Bernard F.; Brink, Robert H., Jr.; and Swered, Paul, to Betz Laboratories, Inc. N-2-nitrobutyl morpholine and hexachlorodimethyl sulfone as a slime control composition. 3,917,834, Cl. 424-248.000.

Sheppard, Chester Stephen: *See—*
D'Angelo, Antonio Joseph; Mageli, Orville Leonard; and Sheppard, Chester Stephen, 3,917,745.
MacLeay, Ronald Edward; and Sheppard, Chester Stephen, 3,917,744.

Sheppard, Richard H. Switchable ratio steering system. 3,916,730, Cl. 74-751.000.

Sherk, Thomas A., to International Business Machines Corporation. Method for applying a dielectric glass to a glass substrate. 3,917,882, Cl. 427-108.000.

Sherman, Ralph R., Jr., to General Electric Company. Battery charging control using temperature differential circuit. 3,917,990, Cl. 320-35.000.

Sherwin-Williams Company, The: *See—*
Blower, Warren A.; and Nara, Harry R., 3,916,982.
Blower, Warren A., 3,917,233.
Miller, Leon F.; Herbruggen, Henry J.; and Shields, Robert G., 3,916,976.

Shibuya, Chisei: *See—*
Ouchi, Shunji; and Shibuya, Chisei, 3,917,683.

Shields, Robert G.: *See—*
Miller, Leon F.; Herbruggen, Henry J.; and Shields, Robert G., 3,916,976.

Shima Sdea Center Company Limited: *See—*
Yabuta, Masahiro, 3,916,647.

Shima, Takeo: *See—*
Urasaki, Takanori; Oka, Isao; Ogasawara, Makoto; and Shima, Takeo, 3,917,731.

Shimazaki, Yasumi: *See—*
Takeshita, Kazuma; Sato, Kenji; and Shimazaki, Yasumi, 3,916,663.

Shimizu, Hirotoshi; and Uozumi, Toshiaki, to Fijitsu Limited. Clutter signal suppression radar. 3,918,055, Cl. 343-5.00R.

Shimizu, Ikuo; Furuno, Hiroshi; and Oki, Ryuji, to Sony Corporation. Differential amplifier circuit. 3,918,004, Cl. 330-30.00D.

Shimizu, Kazuaki, to Nissan Motor Company Limited. Closed loop type disc brake assembly. 3,917,034, Cl. 188-73.400.

Shimizu, Norio: *See—*
Sakai, Satoshi; Shimizu, Norio; Nomura, Junji; and Ueji, Norboru, 3,916,522.

Shimojo, Sumio: *See—*
Yasue, Masayuki; Saito, Sizuo; Shimojo, Sumio; and Shiode, Kazuhisa, 3,917,807.

Shinagawa Automotive Electric Wire Co., Ltd.: *See—*
Hirokawa, Kazuaki; and Anbo, Tsugio, 3,917,371.

Shinn, Robert D.; and Keith, Willis C., to Atlantic Richfield Company. Purification of isophthalic acid. 3,917,681, Cl. 260-525.000.

Shinoda, Takayuki: *See—*
Mimino, Tohru; Kinoshita, Kazuhisa; Shinoda, Takayuki; and Minegishi, Isao, 3,917,493.

Shiode, Kazuhisa: *See—*
Yasue, Masayuki; Saito, Sizuo; Shimojo, Sumio; and Shiode, Kazuhisa, 3,917,807.

Shiozuka, Osamu: *See—*
Tamura, Yuhei; Shiozuka, Osamu; Iwasaki, Toshihiko; Fujimura, Yoshio; and Abe, Kenzo, 3,917,503.

Shirai, Haruji; Ishihara, Hisamitu; and Ogata, Taizo, to Tokyo Automatic Machineryworks Ltd. Cigarette forwarding apparatus. 3,917,049, Cl. 198-32.000.

Shirai, Iwao: *See—*
Iketani, Seijiro; Fukuda, Hiromi; and Shirai, Iwao, 3,917,898.

Shiraki, Yoichi; Wakabayashi, Shoichi; Yokoyama, Mitsunobu; Yokoyama, Isao; Sugahara, Shigeji; and Ogasawara, Satoshi, to TDK Electronics Company. Method for slip casting soft ferromagnetic ferrites. 3,917,778, Cl. 264-63.000.

Shirasaka, Kaname; Tomiyori, Takashi; Simizu, Nobuo; Yamashita, Iwao; and Nakai, Koithi, to Mitsuboshi Belting, Ltd. Automatic belt building apparatus. 3,917,502, Cl. 156-353.000.

Shoebridge, Harold P., to ATI Industries. Vehicle leveling and stabilizing system. 3,917,307, Cl. 280-104.000.

Shoji, Akira, to Canon Kabushiki Kaisha. Microfiche film projector device. 3,917,389, Cl. 353-27.000.

Shono, Tetsuji, to Asahi Kogaku Kohyo Kabushiki Kaisha. Light shield arrangement for an eyepiece system of a single lens reflex camera having an electronic shutter. 3,918,076, Cl. 354-219.000.

Short, Oliver Alton, to Du Pont de Nemours, E. I., and Company. Cadmium-containing silver conductor compositions. 3,917,487, Cl. 106-1.000.

Shotwell, Daniel Bronson, to Caterpillar Tractor Co. Vibration isolating grip for pneumatic hand tools. 3,916,478, Cl. 16-116.00R.

Shoup, Ransom F. Protective plate for a voting machine. 3,917,923, Cl. 235-51.000.

Showa Densen Denran Kabushiki Kaisha: *See—*
Iketani, Seijiro; Fukuda, Hiromi; and Shirai, Iwao, 3,917,898.

Shreve, Russell L.: *See—*
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Shriver, Edward L.: *See—*
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Shuman, Dennis A.: *See—*
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Shupe, Russell D.; Maddox, Jim, Jr.; and Tate, Jack F., to Texaco Inc. Secondary recovery method. 3,916,995, Cl. 166-271.000.

Shupe, Russell D.; Maddox, Jim, Jr.; and Tate, Jack F., to Texaco Inc. Secondary recovery method. 3,916,996, Cl. 166-271.000.

Shupe, Russell D.: *See—*
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Shuster, Edward J.: *See—*
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Siclari, Francesco; and D'Alo, Bruno, to Snia Viscosa Societa Nazionale Industria Applicazioni Viscosa S.p.A. Method for the production of polyamides by adding polyethyleneglycol having a low index of dispersion. 3,917,740, Cl. 260-857.0PG.

Sidler, Hans; and Stalder, to Sistag, Maschinenfabrik Sidler Stalder AG. Slide valve having adjustable packing. 3,917,223, Cl. 251-214.000.

Sidor, Edward F.; and Eikelberger, Rand J., to Illinois Tool Works Inc. Temperature sensor with hysteresis. 3,917,970, Cl. 307-117.000.

Sidor, Edward F., to Illinois Tool Works Inc. Magnetic flux closure member for an angular velocity sensing device. 3,917,997, Cl. 324-166.000.

Siegler, E. Horace, Jr., to Perkin-Elmer Corporation, The. Optical beam splitter. 3,917,406, Cl. 356-88.000.

Siemens Aktiengesellschaft: *See—*
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Heubeck, Erich; and Behne, Ernst-August, 3,917,203.
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Ludwig, Martin; Queisser, Rudolf; and Schlossbauer, Hubert, 3,918,090.
Menzel, Willi; and Bauer, Peter, 3,917,978.
Sailer, Heinrich; Schatz, Norbert; and Schollmeier, Gero, 3,918,001.
Schroder, Heinz-Jurgen; and Berger, Wolfgang, 3,916,841.
Winkler, Hans-Werner, 3,917,949.

Sifniades, Stylianos; and Tunick, Allen Abraham, to Allied Chemical Corporation. Recovery of lysine values by removal of ammonium chloride from lysine containing liquors. 3,917,684, Cl. 260-534.00L.

SIGMA-TAU Industrie Farmaceutiche Riunite S.p.A.: *See—*
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Signacom Systems, Inc.: *See—*
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Signetics Corporation: *See—*
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Youmans, Albert P., 3,918,079.

Simeth, Claus, to Roland Offsetmaschinenfabrik Faber & Schleicher AG. Adjusting device for the lateral ink distribution on printing presses. 3,916,791, Cl. 101-141.000.

Simizu, Nobuo: *See—*
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Simmonds Precision Products, Inc.: *See—*
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Simon, Georges: *See—*
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Simons, Paul B.: *See—*
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Singh, Gurbuksh: *See—*
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Prithvi Raj; Srimal, Rikhab Chand; Dhawan, Bhola Nath; and Anand, Nitya, 3,917,599.
Singh, Ritindar, to Stal-Lavel Turbin AB. Atomizing apparatus for finely distributing a liquid in an air stream. 3,917,173, Cl. 239-400.000.
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Sirrenberg, Wilhelm; Homeyer, Bernard; Hammann, Ingeborg; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. Dichlorovinylthionophosphoric acid ester amides. 3,917,754, Cl. 260-957.000.
Sisson, Ronald L.; and Shellberg, James E., to Clark Equipment Company. Transmissions. 3,916,710, Cl. 74-331.000.
Sisson, Ronald L.; and Shellberg, James E., to Clark Equipment Company. Transmissions. 3,916,714, Cl. 74-331.000.
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Skold, Mats Folke. Spacer clip for joining and supporting crosswisely extending reinforcing bars. 3,916,593, Cl. 52-686.000.
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Bumpus, Francis Merlin; Khosla, Mahesh Chandra; and Smeby, Robert Rudolph, 3,917,580.
Smith, Allen E. Rail car with swing platform and vertical position fixing means. 3,916,799, Cl. 105-368.00B.
Smith, Brian Frank; and Partington, Norman, to Platt International Limited. Variable speed transmission gear boxes. 3,916,705, Cl. 74-230.17A.
Smith, David Cunningham, to William Boulton Limited. Vibro-gyratory finishing machines. 3,916,575, Cl. 51-163.000.
Smith, Ernest L., to Phillips Petroleum Company. Stackable container and cover. 3,917,157, Cl. 229-43.00R.
Smith, Fred W.; Jarman, Robert E.; and Shreve, Russell L., to Bultaco, Compania Espanola Espanola De Motores, S.A. Motorcycle suspension system. 3,917,313, Cl. 280-284.000.
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Smith, Lester L. Face mounted hinge. 3,916,480, Cl. 16-159.000.
Smith, Robert J., to Chrysler Corporation. Energy absorbing steering column. 3,916,720, Cl. 74-492.000.
Smith, Robert L.: *See*—
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Smith, Trevor Stanley: *See*—
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Smith, Walter E. Guitar conversion. 3,916,753, Cl. 84-267.000.
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Snia Viscosa Societa Nazionale Industria Applicazioni Viscosa S.p.A.: *See*—
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Snyder, Gary Francis; and Styczinski, David Alan, to International Business Machines Corporation. Thresholder for analog signals. 3,918,049, Cl. 340-146.3AG.
Sobel, Jay E.: *See*—
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Societe a Responsabilite Limitee EPEX: *See*—
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Societe d'Applications Thermiques: *See*—
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Societe d'Assistance Technique Pour Produits Nestle S.A.: *See*—
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Societe d'Emballage et de Conditionnement: *See*—
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Societe Legris France S.A.: *See*—
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Soffer, Michael J.; and Schneider, Richard S., to Syva Corporation. Isothiocyanate and thiourea derivatives of benzoyl ecgonine conjugated to polypeptides. 3,917,582, Cl. 260-121.000.
Sohner, Gerhard: *See*—
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Sokulski, Sylwester: *See*—
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Spitzberg, Larry A.: *See—*
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Springer, Raymond L. Guard structure for a work table. 3,916,726, Cl. 74-612.000.
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Stachnik, William J., to United States of America, Navy. Navigation aid. 3,917,408, Cl. 356-116.000.
Stahl, Ralph G. Six-degree of freedom towing gear with constant thrust line towing force. 3,916,813, Cl. 115-6.000.
Stal-Lavel Turbin AB: *See—*
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Vincent, Bennett Frank, Jr.; and O'Kane, James L., 3,917,748.
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Stansfield, Fred; and Roe, Michael James, to Doncasters Moorside Limited. Bolt tightening apparatus. 3,917,224, Cl. 254-29.00A.
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Steinman, Douglas E., Jr. Golf training apparatus. 3,917,278, Cl. 273-183.00E.
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Stich, Willi Lorenz, to Norlin Music, Inc. Electrical pickup for a stringed musical instrument. 3,916,751, Cl. 84-1.150.
Stickler, Charles F. Method and apparatus for forming two interfitting preformed parts by heat fusion of said parts. 3,917,497, Cl. 156-73.500.
Stiller, Frank P., to Sandoz, Inc. Process for dyeing oxide layers on aluminum and aluminum alloys. 3,917,887, Cl. 427-343.000.
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Storch, Max H.; and Storch, Clifford, to Astorloid Manufacturing Co., Inc. Picture frame. 3,916,549, Cl. 40-152.100.
Stoufflet, Rene G., to Poclain. Vehicle, similar in type to a tractor, comprising a rigid assembly. 3,917,016, Cl. 180-57.000.
Stout, James T., to Mead Corporation, The. Heavy duty article carrier. 3,917,061, Cl. 206-187.000.
Stoutmeyer, Ronald G.; and Alltop, William O., to United States of America, Navy. Advanced helmet tracker using lateral photodetection and light-emitting diodes. 3,917,412, Cl. 356-152.000.
Stratta, Adriano; and Bruni, Enrico, to Fiat Societa per Azioni. Electronic anti-skid braking system for vehicles. 3,917,357, Cl. 303-21.0CG.
Strauff, Gunther, to Langen & Company. Device for changing the hydraulic transmission ratio of servo-motor steering mechanisms. 3,917,018, Cl. 180-79.20R.
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Strohmeier, Harald; and Muller, Gunter, to Vereinigte Edelstahlwerke AG. Cutting arrangement. 3,916,745, Cl. 83-311.000.
Stroobants, Alphonse. Can trimming apparatus. 3,916,740, Cl. 82-56.000.
Stroobants, Alphonse. Can trimming apparatus. 3,916,746, Cl. 83-666.000.
Strutz, Ernst, to Biviator S.A. Device for measuring the dose of ultraviolet radiation in the erythem-effective range. 3,917,948, Cl. 250-372.000.
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Shiraki, Yoichi; Wakabayashi, Shoichi; Yokoyama, Mitsunobu; Yokoyama, Isao; Sugahara, Shigeji; and Ogasawara, Satoshi, 3,917,778.

Sugiyama, Hiromu: *See—*
Terada, Kimio; Fujita, Satoshi; Kohno, Hiroshige; and Sugiyama, Hiromu, 3,917,859.

Sumitomo Chemical Company, Limited: *See—*
Maruyama, Isamu; Nakao, Masaru; Sasajima, Kikuo; Inaba, Shigeho; and Yamamoto, Hisao, 3,917,598.
Satomi, Takeo; Hino, Naganori; Yoshida, Ryo; and Mukai, Kunio, 3,917,753.
Yasue, Masayuki; Saito, Sizuo; Shimojo, Sumio; and Shiode, Kazuhisa, 3,917,807.

Sumitomo Electric Industries, Ltd.: *See—*
Kawaguchi, Munetaka; and Nakabayashi, Hirohiko, 3,917,892.

Sumitomo Metal Industries, Ltd.: *See—*
Tanoue, Toyosuke; Araki, Taiji; and Aoki, Takeo, 3,917,240.

Summa, Hubert Wayne. Magnetic clutch. 3,917,042, Cl. 192-84.00A.

Sumrell, Gene: *See—*
Mod, Robert R.; Magne, Frank C.; Sumrell, Gene; Novak, Arthur F.; and Solar, James M., 3,917,638.

Sun Electric Corporation: *See—*
Clark, Gary E., 3,917,454.

Sun Oil Company of Pennsylvania: *See—*
Fromnick, Stephen M.; Jones, Ronald E.; and Mayer, Robert, 3,916,811.
Young, Einar T., 3,916,713.

Sun Ventures, Inc.: *See—*
Kirk, Merritt C., Jr.; and Andersson, Craig R., 3,917,557.
Turner, John O.; and Deno, Norman C., 3,917,709.

Sundstrand Corporation: *See—*
Plotsky, Norman, 3,917,117.

Surridge, John H.: *See—*
Baird, William C., Jr.; Hartgerink, Ronald L.; and Surridge, John H., 3,917,670.

Suter, William R., to Cities Service Company. Apparatus and process for preventing blow-outs. 3,917,008, Cl. 175-38.000.

Suva, Tito R.; and Schmidt, Hans-Peter, to Grands Moulins De Paris. Baking oven for bread. 3,917,445, Cl. 432-124.000.

Suvorov, Vladimir Nikolaevich: *See—*
Kabanov, Nikolai Pavlovich; Schukin, Vitaly Sergeevich; Makhalov, Sergei Fedorovich; Knyazev, Jury Alexeevich; Savonichev, Dmitry Nikolaevich; and Suvorov, Vladimir Nikolaevich, 3,917,139.

Suzuki, Teruaki: *See—*
Maeda, Hiroyuki; and Suzuki, Teruaki, 3,917,175.

Suzuki, Tsutomu: *See—*
Hoshika, Mitsuhisa; and Suzuki, Tsutomu, 3,918,026.

Swales, Staveley Graham Anderson. Devices for imparting a scanning motion to mirrors and the like. 3,917,386, Cl. 350-289.000.

Swan, Jack C., Jr.; Bertetto, Donald W.; and Hanson, Chris A., to Hanson Industries Inc. Heating device for custom fitting a ski boot. 3,917,122, Cl. 222-146.0HE.

Swanson, Carl I.: *See—*
Davis, Robert F.; and Swanson, Carl I., 3,917,001.

Swanson, Harold V.; and Bald, Robert E., to Interpace Corporation. Collar for joint of underground pipe. 3,917,285, Cl. 277-1.000.

Swanson, Ronald W.; and Zang, Hyung K., to Texaco Inc. Production of secondary alkyl primary amines. 3,917,705, Cl. 260-583.00M.

Swart, Geraldine Ann. Door protector. 3,916,838, Cl. 119-29.000.

Swatman, Peter Phillimore, to British Leyland (Austin-Morris) Limited. Carburetters fitted to internal combustion engines. 3,917,760, Cl. 261-39.00B.

Sweeney, Donald E., Jr., to Texaco Inc. Means and method for controlling an absorber system. 3,917,931, Cl. 235-151.120.

Sweeney, Maxwell Patrick. Aquaculture system. 3,916,832, Cl. 119-2.000.

Swered, Paul: *See—*
Shema, Bernard F.; Brink, Robert H., Jr.; and Swered, Paul, 3,917,834.

SWF-Spezialfabrik fur Autozubehor Gustav Rau GmbH: *See—*
Kohler, Alfred, 3,916,474.

Swiatowiec, Frank J.; and Rao, Ramachandra A., to Motorola, Inc. High speed counter latch circuit. 3,917,959, Cl. 307-223.00R.

Swiden, Lennart Bror Anders; and Lester, Waldemar. Method and apparatus for control of anti-skid vehicle braking system. 3,917,353, Cl. 303-21.0BE.

Swiger, R. Thomas: *See—*
Webb, Jimmy L.; Corn, John E.; and Swiger, R. Thomas, 3,917,720.

Swisher, George W., Jr.; and Hale, Autho, to CMI Corporation. Side-bank excavator with grade and slope control. 3,916,544, Cl. 37-110.000.

Swisher, George W., Jr.; Hopkins, Michael F.; and Gepfert, Robert K., to CMI Corporation. combination bottom dump and rear discharge trailer. 3,917,084, Cl. 214-83.260.

Swiss Aluminium Ltd.: *See—*
Maitland, Alexander, 3,917,039.

Swope, Thomas J.: *See—*
Holmes, Paul M.; Brant, Douglas M.; Swope, Thomas J.; and Reinker, Joseph F., Jr., 3,916,947.

Symons Corporation: *See—*
Plough, Russell H., 3,917,216.

Syntex (U.S.A.) Inc.: *See—*
Griscom, Richard William, 3,917,717.

Syva Corporation: *See—*
Soffer, Michael J.; and Schneider, Richard S., 3,917,582.

Szczepanski, Norbert; and Baessler, Konrad, to Hoechst Aktiengesellschaft. Process for the continuous manufacture of m-chloronitrobenzene from m-dinitrobenzene. 3,917,723, Cl. 260-646.000.

Szekeres, Laszlo: *See—*
Takacs, Kalman; Szekeres, Laszlo; Harsanyi, Kalman; Papp, Gyula; Neszmelyi, Andras; and Benedek, Eva, 3,917,610.

Szoke, Josef: *See—*
Bak, Bela; Engard, Ferenc; and Szoke, Josef, 3,917,455.

T. A. Pelsue Company: *See—*
Beavers, Allan E., 3,916,870.

Tabuchi, Hideo, to Sony Corporation. Power supply circuit for varying the bias signal to a magnetic head. 3,918,088, Cl. 360-66.000.

Tago, Kazuo: *See—*
Sasaki, Hiroo; Takemoto, Hisao; and Tago, Kazuo, 3,917,660.

Taguchi, Eiji; Nakano, Soichi; and Iizuka, Yoshitoku, to Honda Giken Kogyo Kabushiki Kaisha. Intake and exhaust system for internal combustion engine. 3,916,858, Cl. 123-122.0AB.

Taguchi, Eiji: *See—*
Nakano, Soichi; Taguchi, Eiji; and Iizuka, Yoshitoku, 3,916,847.
Nakano, Soichi; Taguchi, Eiji; Ishii, Yoji; and Iizuka, Yoshitoku, 3,916,860.

Tahara, Toru, to Takigen Manufacturing Co., Ltd. Switch lock assembly. 3,917,919, Cl. 200-44.000.

Takacs, Kalman; Szekeres, Laszlo; Harsanyi, Kalman; Papp, Gyula; Neszmelyi, Andras; and Benedek, Eva, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt. Amino-imidazo and amino-pyrazolo-isoquinolines and process for the preparation thereof. 3,917,610, Cl. 260-288.0CF.

Takada, Yusaku: *See—*
Yamada, Katuhiko; and Takada, Yusaku, 3,916,829.

Takahara, Masaki. Production of phosphoric acid of high purity. 3,917,805, Cl. 423-321.000.

Takahashi, Hiroji: *See—*
Sato, Hiroshi; Takahashi, Hiroji; Kaneko, Takeshi; and Takemura, Toro, 3,917,776.

Takahashi, Toru; and Kadowaki, Syujiro, to Canon Kabushiki Kaisha. Cleaning device. 3,917,398, Cl. 355-15.000.

Takatsuki, Tatsuo, to Kabushiki Kaisha Daini Seikosha. Timepiece provided with a guide bush. 3,916,614, Cl. 58-59.000.

Takeda Chemical Industries, Ltd.: *See—*
Matsuzawa, Tai; Hirai, Shin-ichiro; Fujino, Masahiko; Kobayashi, Shigeru; and Yamazaki, Iwao, 3,917,825.

Takeda, Masashi: *See—*
Ota, Yoshio; and Takeda, Masashi, 3,917,991.

Takekoshi, Tohru; and Kochanowski, John E., to General Electric Company. Method for making polyetherimides and products produced thereby. 3,917,643, Cl. 260-326.00R.

Takemoto, Hisao: *See—*
Sasaki, Hiroo; Takemoto, Hisao; and Tago, Kazuo, 3,917,660.

Takemura, Toro: *See—*
Sato, Hiroshi; Takahashi, Hiroji; Kaneko, Takeshi; and Takemura, Toro, 3,917,776.

Takeshige, Koshuke: *See—*
Kisaki, Hisashi; Tsutsumi, Yukihiro; and Takeshige, Koshuke, 3,917,676.

Takeshita, Kazuma; Sato, Kenji; and Shimazaki, Yasumi, to Nippon Steel Corporation. Apparatus for forming spiral steel pipe. 3,916,663, Cl. 72-135.000.

Takeshita, Yoshimasa: *See—*
Sato, Yutaka; Nakata, Yoshinori; Nishimori, Shoji; Nishii, Takeshi; Wakita, Masayasu; and Takeshita, Yoshimasa, 3,916,512.

Takeuchi, Hiroo, to Nisshin Kogyo Kabushiki Kaisha. Fluid pressure control device with a failure alarm for a vehicle brake system. 3,917,355, Cl. 303-6.00C.

Takeuchi, Yasuhisa; and Iizuka, Haruhiko, to Nissan Motor Company Limited. Control device for an automotive brake system. 3,917,358, Cl. 303-21.0BE.

Takigawa, Kazue; and Ueno, Toshio, to Daitoseiki Co. Ltd.; Japan Society for the Promotion of Machine Industry; and Nippon Pulsmotor Co. Ltd. Electronic patterning process for a knitting machine. 3,916,646, Cl. 66-50.00R.

Takigen Manufacturing Co., Ltd.: *See—*
Tahara, Toru, 3,917,919.

Takizuka, Michinori: *See—*
Araki, Ikuo; Takizuka, Michinori; and Kanazawa, Teruo, 3,916,618.

Tamura, Kouji: *See—*
Toida, Tsutomu; Matsuoka, Seiichi; Yamamoto, Kenzo; and Tamura, Kouji, 3,917,467.

Tamura, Sachiko: *See—*
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Tamura, Yuhei; Shiozuka, Osamu; Iwasaki, Toshihiko; Fujimura, Yoshio; and Abe, Kenzo, to Asahi Glass Company, Ltd. Apparatus for pressing laminated assemblies. 3,917,503, Cl. 156-382.000.

Tanaka, Mitsugu: *See—*
Arai, Atsuaki; and Tanaka, Mitsugu, 3,917,653.

Tanaka, Nobuo: *See—*
Kubotera, Haruo; Nakaoka, Kazuhide; Watanabe, Kaoru; Nishimoto, Akihiko; and Tanaka, Nobuo, 3,917,494.

Tanaka, Susumu; Enoguchi, Yuji; and Kawabata, Hidetoshi, to Minolta Camera Kabushiki Kaisha. Mechanism for removing residual toner from electrostatic copier drum. 3,917,397, Cl. 355-15.000.

Tanaka, Yoichi: *See—*
Saita, Nobuo; and Tanaka, Yoichi, 3,917,932.
Tanazawa, Toru: *See—*
Fujita, Hisaya; Harada, Kinji; and Tanazawa, Toru, 3,918,066.
Tannaka, Yasuaki: *See—*
Koshikawa, Tsuneji; Katakura, Kageyoshi; Kobayashi, Masaharu; and Tannaka, Yasuaki, 3,918,025.
Tanoue, Toyosuke; Araki, Taiji; and Aoki, Takeo, to Sumitomo Metal Industries, Ltd. Apparatus for projecting pieces of a deoxidizing agent into molten steel. 3,917,240, Cl. 266-34.00T.
Tate, Jack F.: *See—*
Maddox, Jim, Jr.; Tate, Jack F.; and Shupe, Russell D., 3,916,994.
Shupe, Russell D.; Maddox, Jim, Jr.; and Tate, Jack F., 3,916,995.
Shupe, Russell D.; Maddox, Jim, Jr.; and Tate, Jack F., 3,916,996.
Taub Family Trust: *See—*
Taub, Ronald H., 3,917,056.
Taub, Ronald H., to Taub Family Trust. Pivotally articulated container with crossed folds. 3,917,056, Cl. 206-44.000.
Taylor, Alan: *See—*
Brewer, Donald; Jerram, William Arthur; and Taylor, Alan, 3,917,820.
Taylor, Byron Kent; and Carlin, William Henry, to RCA Corporation. Detachable pickup arm magnetic coupling. 3,917,903, Cl. 178-6.60R.
Taylor, Chandler R., Jr.: *See—*
Allen, Richard C.; and Taylor, Chandler R., Jr., 3,917,842.
Taylor, Howard W.; and Pedersen, Richard C., to Farmhand, Inc. Door apparatus and actuator for a crop gathering machine. 3,917,343, Cl. 298-23.0DF.
Taylor, Ian Keith: *See—*
Morser, Alfred Harold; Gibson, Roy; Scott, Stephen Anthony; Bailey, Clifford Michael; and Taylor, Ian Keith, 3,918,045.
Taylor, Van L. Bait sounder. 3,916,557, Cl. 43-43.120.
TDK Electronics Company: *See—*
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Technal Corporation: *See—*
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Technical Devices, Inc.: *See—*
Runyon, Robert C., 3,917,148.
Techway, Inc.: *See—*
Runyon, Larry K., 3,916,565.
Tecna Corporation: *See—*
Buck, Keith E.; Kitrilakis, Sotiris; and Robinson, Thomas C., 3,916,888.
Tedesh, George E. Lawn edge trim guard. 3,916,563, Cl. 47-33.000.
Tee-Pak, Inc.: *See—*
Bridgeford, Douglas J., 3,917,862.
Burke, Noel L., 3,917,855.
Coleman, Harold R., 3,917,894.
Teijin Limited: *See—*
Urasaki, Takanori; Oka, Isao; Ogasawara, Makoto; and Shima, Takeo, 3,917,731.
Yamada, Seibi; and Ishida, Kinyu, 3,916,609.
Tekno Industries, Inc.: *See—*
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Telesco Brophey Limited: *See—*
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Teletype Corporation: *See—*
Riley, Arthur F., 3,917,048.
Telford, James W.: *See—*
Wagner, Peter B.; Telford, James W.; and Hanaway, Richard W., 3,917,996.
Telford, John Michael: *See—*
Feather, Peter; Kendle, Keith Emery; and Telford, John Michael, 3,917,658.
Tellie, Paul E., to ETAT FRANCAIS - Delegation Ministerielle Pour L'Armement. Sighting means for firearms. 3,916,530, Cl. 33-241.000.
Temcor: *See—*
Richter, Donald L., 3,916,589.
Tennant Company: *See—*
Bricher, Charles W., 3,917,350.
Tenney, William L. Dispensing apparatus and method. 3,917,168. Cl. 239-13.000.
Terada, Kimio; Fujita, Satoshi; Kohno, Hiroshige; and Sugiyama, Hiromu, to Asahi Denka Kogyo Kabushiki Kaisha. Edible oil in water in oil emulsion. 3,917,859, Cl. 426-602.000.
Teradyne, Inc.: *See—*
Johnson, Lennart B., 3,917,375.
Terma Elektronisk Industri A/S: *See—*
Elgaard, Christen Hagbard, 3,918,061.
Terminal Data Corporation: *See—*
Burton, John S.; and Whitney, Ronald L., 3,918,077.
Terry, Floyd Luke. Wind operated adjustable bird feed dispenser. 3,917,128, Cl. 222-410.000.
Tetreault, Yves E.; Arcouette, Leonard; and Cadorette, Serge. Sectional canoe. 3,916,468, Cl. 9-2.00S.
Texaco, Inc.: *See—*
Hudson, Ralph B., Jr.; and Gates, Walter C., Jr., 3,917,706.
Maddox, Jim, Jr.; Tate, Jack F.; and Shupe, Russell D., 3,916,994.
Miller, Gordon H.; and Renick, Edward O., Jr., 3,916,674.
Richter, George N.; Slater, William L.; Child, Edward T.; and Ahlborn, John C., 3,917,569.
Rundell, Herbert A., 3,916,684.
Shupe, Russell D.; Maddox, Jim, Jr.; and Tate, Jack F., 3,916,995.
Shupe, Russell D.; Maddox, Jim, Jr.; and Tate, Jack F., 3,916,996.
Swanson, Ronald W.; and Zang, Hyung K., 3,917,705.
Sweeney, Donald E., Jr., 3,917,931.
Texas Instruments Incorporated: *See—*
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Leuschner, Horst, 3,918,002.
Watson, William J., 3,918,031.
Texeira, Patrick D.: *See—*
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Texmark, Inc.: *See—*
Filsinger, John F.; and Mueller, Roger P., 3,916,783.
Textron, Inc.: *See—*
Enoch, William K., 3,916,928.
Lombard, Ralph S., 3,916,853.
Theeuwes, Felix; and Higuchi, Takeru, to Alza Corporation. Osmotic dispensing device with maximum and minimum sizes for the passageway. 3,916,899, Cl. 128-260.000.
Thiel, Max: *See—*
Winter, Werner; Thiel, Max; Stach, Kurt; Schaumann, Wolfgang; and Roesch, Androniki, 3,917,596.
Thiel, Wilhelm M., to Deis, Danielle. Musical instrument for chord accompaniment. 3,916,754, Cl. 84-402.000.
Thies, Peter Willibrord, to Kali-Chemie AG. Dioxatricyclodecanones. 3,917,651, Cl. 260-340.300.
Thimon, Hubert, to Societe d'Applications Thermiques. Machine for packaging goods. 3,916,601, Cl. 53-204.000.
Thomas & Betts Corporation: *See—*
Luongo, Albert M., 3,916,517.
Thomas Conveyor Company, Inc.: *See—*
Herold, Robert R., 3,917,091.
Thomas, John P., to Interseas Associates. Telescopic caisson with intermediately positioned wellhead. 3,916,632, Cl. 61-46.000.
Thomas, Thomas L.: *See—*
Lynch, Howard M.; and Thomas, Thomas L., 3,916,553.
Thompson, Alistair Nigel. Trench shoring machines. 3,916,629, Cl. 61-41.00A.
Thompson, Darrell R., to Celanese Corporation. Stabilized polyacrylonitrile compositions with sulfur containing stabilizer and method of forming same. 3,917,553, Cl. 260-29.6AN.
Thompson, Lenore E., to Kimberly-Clark Corporation. Low cost, absorbent, clinging, aqueous liquid barrier protective covering. 3,916,447, Cl. 2-46.000.
Thompson, Robert L., to Browning-Ferris Industries, Inc. Catalyst unloader apparatus and method. 3,916,960, Cl. 141-1.000.
Thomsen, Hans Thomas: *See—*
Foge, Helga Helene; and Thomsen, Hans Thomas, 3,917,038.
Thomson-CSF: *See—*
Gerard, Andre; and Lacombat, Michel, 3,917,926.
Thomson, James K.: *See—*
Di Benedetto, Gilberto; and Thomson, James K., 3,917,968.
Thorne, John K.; and Sobel, Jay E., to Universal Oil Products Company. Method of making spiral tube mixing device. 3,916,504, Cl. 29-455.000.
Thornton, David Charles; Lightner, Linn Stephen; and Lannan, Patrick Edward, to AMP Incorporated. Interconnect device for use in closed fluid circulating systems. 3,917,370, Cl. 339-16.00R.
Thorpe, John E.: *See—*
Bass, Robert J.; Koch, Richard C.; Richards, Hugh C.; and Thorpe, John E., 3,917,838.
Thorson, Clayton W., to Eaton Corporation. Flow divider valve assembly. 3,916,932, Cl. 137-101.000.
Thurman, Paul G., to Dare Plastics Inc. Plastic tray and method of making same. 3,917,108, Cl. 220-66.000.
Thweatt, John G.: *See—*
Pond, David M.; and Thweatt, John G., 3,917,710.
Tillac, Jean F.: *See—*
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Timex Corporation: *See—*
Esselborn, Fred, 3,916,613.
Tingey, Bruce K.; and Howcroft, Robert Kent, to H & T Industries. Spark gap type electric shock-producing prod. 3,917,268, Cl. 273-84.000.
Titeflex: *See—*
Gazda, Chester T.; and Lalikos, James M., 3,916,488.
Tkatchenko, Igor, to Union Chimique Elf-Aquitaine; and Institut Francais du Petrole, des Carburants et Lubrifiants. New catalyst for the dimerization of diolefins. 3,917,730, Cl. 260-666.00B.
Tobey, Hubert E.; Masiuk, Alphonse M.; Hood, John W.; and Irvin, Dee L., to International Telephone and Telegraph Corporation. Method of pre-slicing a muffin for easy separation. 3,917,868, Cl. 426-497.000.
Toch, Herbert. Lymph duct cannulation facilitator. 3,916,875, Cl. 128-2.00A.
Todereanu, Corneliu; Dimitriu, Iustin-Gheorghe; Filip, Ioan-Romulus; and Ichim, Diona, to Grupul Industrial de Chimie. Process for purifying electrolytic hydrogen. 3,917,810, Cl. 423-648.000.
Tohkai Denkia Tosoh Kabushiki Kaisha: *See—*
Eiki, Hiroshi, 3,916,807.
Toida, Tsutomu; Matsuoka, Seiichi; Yamamoto, Kenzo; and Tamura, Kouji, to Japan Gasoline Co., Ltd. Process for manufacturing high purity methane gas. 3,917,467, Cl. 48-197.00R.
Tokico Ltd.: *See—*
Kubota, Shokichi; and Akiyama, Tadahiro, 3,917,221.

Tokura, Susumu: *See—*
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Tokyo Automatic Machineryworks Ltd.: *See—*
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Tokyo Yogyo Kabushiki Kaisha: *See—*
Nigorikawa, Tetsu; Sakai, Masanori; and Nakajima, Masayoshi, 3,917,130.
Tomita, Yoshifumi: *See—*
Akagi, Motoo; Oba, Yoichi; Kohashi, Takahiro; Morishita, Hazime; Kimura, Toyoaki; Nonogaki, Saburo; Oikawa, Mitsuru; Otomo, Yoshiro; and Tomita, Yoshifumi, 3,917,794.
Tomitaka, Tokuhiro, to Hitachi, Ltd. Device for opening and closing shutter of ventilating fan. 3,917,433, Cl. 415-148.000.
Tomiyori, Takashi: *See—*
Shirasaka, Kaname; Tomiyori, Takashi; Simizu, Nobuo; Yamashita, Iwao; and Nakai, Koithi, 3,917,502.
Toms River Chemical Corporation: *See—*
Fitzpatrick, Joseph William; and Schmidt, Harold Norbert, 3,917,640.
Tomy Kogyo Co., Inc.: *See—*
Kato, Kosei, 3,916,561.
Topham, Arthur: *See—*
Paget, Hugh Patrick Dryhurst; Rogers, Leslie Richard; Royle, James Kenneth Davenport; Stansfield, James Frederick; and Topham, Arthur, 3,917,639.
Torrence, Samuel L.; and Walker, William C., to Westvaco Corporation. Sulfur oxide adsorption and recovery. 3,917,799, Cl. 423-244.000.
Touro, Freddie J.: *See—*
Fisher, Bernard M.; Hills, Robert C.; and Touro, Freddie J., 3,917,519.
Towne, Herbert; and Rapp, Harold, to Dialight Corporation. Digital display. 3,918,053, Cl. 340-380.000.
Townsend, Loren R. Air-powered sprinkler system. 3,916,942, Cl. 137-344.000.
Toyo Boseki Kabushiki Kaisha: *See—*
Amagi, Yasuo; Nishimura, Yasushi; and Uehara, Yasuo, 3,917,806.
Toyo Kinzoku Corporation: *See—*
Wakatsuki, Hiroe; and Nishimura, Toshio, 3,917,324.
Toyo Soda Manufacturing Co., Ltd.: *See—*
Kisaki, Hisashi; Tsutsumi, Yukihiro; and Takeshige, Koshuke, 3,917,676.
Sasaki, Hiroo; Takemoto, Hisao; and Tago, Kazuo, 3,917,660.
Traina, John E.: *See—*
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Transfer Systems Incorporated: *See—*
Jones, Cecil R., 3,917,335.
Traub, Stefan: *See—*
Courtin, Erich; and Traub, Stefan, 3,916,878.
Travers, Arthur; and Leite, Robert, to AMF Incorporated. Diving cylinder with liner. 3,917,115, Cl. 222-3.000.
Trevithick, Tony, to Daniel Woodhead, Inc. Lamp guard. 3,917,941, Cl. 240-102.00R.
Trieschmann, Hans-Georg; Pfannmueller, Helmut; Urban, Friedrich; Buechner, Oskar; Steigerwald, Klaus; and Ball, Wolfgang, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Continuous production of ethylene homopolymers. 3,917,577, Cl. 260-94.90R.
Tropel, Inc.: *See—*
Buzawa, M. John; and Munnerlyn, Charles R., 3,917,399.
Trost, John R.: *See—*
Scheuneman, James H.; and Trost, John R., 3,917,933.
Trotter, Albin; and Trotter, Ursus. Diaphragm valve for controlling supply of gas to water heater. 3,917,162, Cl. 236-23.000.
Trotter, Ursus: *See—*
Trotter, Albin; and Trotter, Ursus, 3,917,162.
Trump, George S. Heating system. 3,916,991, Cl. 165-163.000.
TRW Inc.: *See—*
Claxton, Dale H.; and Liccini, Raymond P., 3,918,009.
George, E. Paul; and Lincoln, Robert Nelson, 3,917,982.
Meyers, Robert A., 3,917,465.
Woodward, James O., 3,916,666.
Tsang, Floris Y.: *See—*
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Tsiferov, Mikhail Ivanovich. Method of sinking holes in earth's surface. 3,917,007, Cl. 175-14.000.
Tsuchiya, Ryoji: *See—*
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Turner, John O.; and Deno, Norman C., to Sun Ventures, Inc. Acid-catalyzed decomposition of aliphatic hydroperoxides. 3,917,709, Cl. 260-593.00A.
Turney, George Holbrook, to Pennwalt Corporation. Iodine-containing anionic sanitizers. 3,917,822, Cl. 424-150.000.
Turunen, Lasse Juhani, to G. A. Serlachius Oy. Apparatus for forming a sack from a continuous tube blank. 3,916,769, Cl. 93-24.000.
Tusinski, Joseph; and Bobeau, Daniel, to Coburn Optical Industries, Inc. Automatic lens mold gasket stripper. 3,917,077, Cl. 214-1.00R.
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Uhlig, Gerhardt E. Safety closure container. 3,917,097, Cl. 215-216.000.
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Van Doorn, Donald W.; Colquett, Jack L.; Hawkins, James B.; Pease, William C., III; and Webb, Tommy W., to Lummus Industries, Inc. Apparatus for bailing fibers. 3,916,778, Cl. 100-4.000.

Vanhoof, Pierre M.; and Clarebout, Pierre M., to A. Christiaens, Societe Anonyme. New derivatives of 1,4-benzodioxan, the preparation and the use thereof. 3,917,628, Cl. 260-296.00B.

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Van Tol, Nicolaas, to U.S. Philips Corporation. Circuit arrangement for the identification of vehicles. 3,918,057, Cl. 343-6.80R.

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Viera, Paul E.; Benincasa, Anthony; Halladay, Paul D.; and LaTour, Diane J., to General Foods Corporation. Process for producing nutritious food. 3,917,861, Cl. 426-274.000.

Villaume, Henry F.; Collins, Stephen D.; and Brauns, Robert Gary, to Howell Laboratories, Incorporated. Redundant automatic moisture dump system. 3,916,936, Cl. 137-204.000.

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Volkov, Igor Vladimirovich; Esibian, Eduard Migranovich; Alexandrov, Mikhail Mikhailovich; Zakrevsky, Stanislav Ivanovich; and Zhukovsky, Petr Grigorievich. Source of power supply of plasmatron arc. 3,917,992, Cl. 323-6.000.

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Von Bebenburg, Walter, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. New aza-10,11-dihydro-5H-dibenzo[b,e]-[1,4]-diazepine. 3,917,585, Cl. 260-239.30T.

Von Bebenburg, Walter; and Offermanns, Heribert, to Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler. Certain 2-oxy-5-phenyl-6-aza-7-chloro-1,2-dihydro-3H-1,4-benzodiazepines. 3,917,629, Cl. 260-296.00H.

von Halasz, Sigmar-Peter, to Hoechst Aktiengesellschaft. Process for preparing perfluoro-2-methyl-pentane. 3,917,726, Cl. 260-653.900.

Voorman, Johannes Otto, to U.S. Philips Corporation. Gyrator resonant circuit having regulation of supply current. 3,918,014, Cl. 334-14.000.

Vrieland, G. Edwin; and Friedli, Hans R., to Dow Chemical Company, The. Method of oxydehydrogenation of alkyl aromatic compounds. 3,917,732, Cl. 260-669.00R.

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Wada, Sadae. Invalid carriage. 3,917,311, Cl. 280-238.000.

Wadlington, James Carroll, to Bell Telephone Laboratories, Incorporated. Sampling circuit. 3,917,963, Cl. 307-254.000.

Wagner, Peter B.; Telford, James W.; and Hanaway, Richard W., to United States of America, Navy. Electric field measuring device. 3,917,996, Cl. 324-72.000.

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Walberg, Maynard E., to Allis-Chalmers Corporation. Thermal protective arrangement for clutches. 3,917,041, Cl. 192-30.00W.

Waldmann, Hans; Schwarz, Wilfried; Bergfeld, Manfred; Laupitz, Hans Joachim; Muller, Klaus; and Oleszko, Thaddeus J., to Linde Aktiengesellschaft. Coke-cooling apparatus. 3,917,516, Cl. 202-227.000.

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Waller, Gustav Martin; and Landmark, Kenneth L., to Tunco Manufacturing Inc. Slotted abrasive wheel. 3,916,579, Cl. 51-206.00P.

Walraven, Anthonie; Koorneef, Jacob; and Potgiesse, Jan Antoon Ludolf, to U.S. Philips Corporation. Device for controlling the position of a magnetic head with respect to an information track to be followed. 3,918,091, Cl. 360-77.000.

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Walters, Russell W., to BMR Security Products Corporation. Weapon security rack. 3,917,071, Cl. 211-64.000.

Waltman, Robert E.: *See—*
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Walton, Charles A., to Proximity Devices, Inc. Voltage controlled sweep oscillator. 3,918,008, Cl. 331-108.00B.

Wankel G.m.b.H.: *See—*
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Ward, Harold R., to Eaton Corporation. Hydrostatic driving and steering transmission. 3,917,014, Cl. 180-6.480.

Ward, John Joseph Bernard: *See—*
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Ware Fuse Corporation: *See—*
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Ware, Gordon K., to Ware Fuse Corporation. Outlet box and method of making the same. 3,917,101, Cl. 220-3.200.

Warner-Lambert Company: *See—*
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Lane, George C.; Cartwright, Cyril A.; and Elmslie, Keith W., 3,916,523.
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Warner & Swasey Company, The: *See—*
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Warwick, Edward H.: *See—*
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Wasserman, Eric I. Valve for tympanic membrane ear surgery. 3,916,873, Cl. 128-1.00R.

Wasteland Reclamation Corporation: *See—*
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Watanabe, Kaoru: *See—*
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Waterman, Dwight Ray; Brown, Gary G.; and Mills, George J., to Northrop Corporation. Method for strengthening boron filaments for use in forming filamentary composites. 3,917,783, Cl. 264-85.000.

Waters Associates: *See—*
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Waters, Geoffrey Dallinger: *See—*
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Waters, John E., Jr. Ceramic composition and methods. 3,917,489, Cl. 106-110.000.

Watkins, Windell C., to Eastman Kodak Company. Catalytic process for the manufacture of unsaturated acids and esters. 3,917,673, Cl. 260-486.00D.

Watrous, Howard N., to Procter & Gamble Company, The. Apparatus for folding of a web. 3,917,254, Cl. 270-86.000.

Watrous, Howard N., to Procter & Gamble Company, The. Apparatus for folding of a web. 3,917,255, Cl. 270-86.000.

Watson, George W. Disposable toothbrush. 3,917,420, Cl. 401-286.000.

Watson, William J., to Texas Instruments Incorporated. Dual mode bulk memory extension system for a data processing. 3,918,031, Cl. 340-172.500.

Watson, William M.: *See—*
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Watts, Peter Edward; and Holden, Ernest Michael, to Vickers Limited. Printing. 3,916,789, Cl. 101-148.000.

Wave Energy Systems Inc.: *See—*
Boucher, Raymond Marcel Gut, 3,917,850.

Wawretschek, Helmuth, to Servomed Arznei GmbH & Co Pharma KG. Antitussivum. 3,917,836, Cl. 424-251.000.

Webb, Jimmy L.; Corn, John E.; and Swiger, R. Thomas, to General Electric Company. Continuous process for the production of a diol from a diol ester. 3,917,720, Cl. 260-635.00R.

Webb, Tommy W.: *See—*
Van Doorn, Donald W.; Colquett, Jack L.; Hawkins, James B.; Pease, William C., III; and Webb, Tommy W., 3,916,778.

Weber, Helmut; Aumuller, Walter; Weyer, Rudi; Muth, Karl; and Schmidt, Felix Helmut, to Hoechst Aktiengesellschaft. Benzenesulfonyl ureas and process for their manufacture. 3,917,690, Cl. 260-553.0DA.

Wei, Peter H. L., to American Home Products Corporation. 7-[2-(Cycloalkyleneimino-2yl)thioacetamido]cephalosporanic acid. 3,917,591, Cl. 260-243.00C.

Weidler, Erhard Alfred. Chain lock. 3,916,616, Cl. 59-85.000.

Weier, Roman J.: *See—*
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Leimgruber, Willy; and Weigele, Manfred, 3,917,646.

Weigert, Franz. Method of and system for making synthetic fossils. 3,917,786, Cl. 264-129.000.

Weightman, Robert F.: *See—*
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Weil-McLain Company, Inc.: *See—*
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Weinberg, Alan E.: *See—*
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Weisbrod, Sherman, to RCA Corporation. Protection circuit. 3,917,980, Cl. 317-33.0VR.

Weiss, Anton Georg: *See—*
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Welding Engineers, Incorporated: *See—*
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Wells, David L. Centrifugal pulley with movable flange supported by rollers on a square shaft. 3,916,707, Cl. 74-230.17E.

Wells, John B.; and Gundlach, Robert W., to Xerox Corporation. Electrophoretic imaging system. 3,917,880, Cl. 427-14.000.

Wells, Rodney Lee; Lofquist, Robert Alden; and Lazarus, Stanley David, to Allied Chemical Corporation. Polythioureas to inhibit ozone fading of dyed polyamides. 3,917,449, Cl. 8-165.000.

Welti, George R., to Communications Satellite Corporation. Butler matrix transponder. 3,917,998, Cl. 325-3.000.

Wenderoth, Anthony, to Spectral Data Corporation. Effective focal length adjusting additional lens system for multispectral camera-projector. 3,917,390, Cl. 353-31.000.

Wendt, Frank W.: *See—*
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Werner & Mertz GmbH: *See—*
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Wescom, Inc.: *See—*
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Wesner, Charles R., to Sperry Rand Corporation. Comparator for step data gyro compasses. 3,917,928, Cl. 235-92.0CA.

Wessling, Ritchie A.: *See—*
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West, Gaylon L.: *See—*
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West, Henry L. Rotary web perforating apparatus. 3,916,744, Cl. 83-175.000.

West, Roland J., to Vaughn Corporation. Vehicle ramp. 3,917,227, Cl. 254-88.000.

West, Thomas B.; King, Ernest V.; and Hindman, William S., to Burlington Engineering Sales Co. Fabric treatment apparatus. 3,916,653, Cl. 68-15.000.

West Virginia High Bird Corporation(Entire): *See—*
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Western Electric Company, Incorporated: *See—*
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Westinghouse Air Brake Company: *See—*
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Westinghouse Canada Limited: *See—*
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Westinghouse Electric Corporation: *See—*
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Weyer, Rudi: *See—*
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White, Edward Louis; Robertson, William Ernest; and Yu, William Heng-Sen, to N L Industries, Inc. Basic zinc phosphites. 3,917,804, Cl. 423-305.000.

White, Joseph, to Compoflex Company Limited. Method of making flexible hose. 3,916,505, Cl. 29-456.000.

White-Westinghouse Corporation: *See—*
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Whiting Corporation: *See—*
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Wick, Helmut: *See—*
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Wickman Machine Tool Sales Limited: *See—*
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Wilford, Ernest, to Associated Weavers Limited. Support roll cleaning devices. 3,916,475, Cl. 15-256.510.

Wilhelm, Friedrich. Method of and apparatus for burying stiff-walled pipes in the ground. 3,916,636, Cl. 61-72.700.

Wilkerson, Joseph B.; and Reader, Kenneth R. Cam and nozzle control valve for fluid flow modulation. 3,917,435, Cl. 416-20.000.

Wilkins, Douglas S. Ski equipment carrying apparatus. 3,917,137, Cl. 224-45.00S.

William Boulton Limited: *See—*
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William H. Roher, Inc.: *See—*
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Williams, John Ronald; and Lenz, Terry Gene, to Du Pont de Nemours, E. I., and Company. Suppression of 1,2-diaminocyclohexane formation during production of hexamethylenediamine. 3,917,707, Cl. 260-583.00K.

Williams, Richard D.; and Michaels, Fred G. Control mechanism. 3,917,021, Cl. 180-114.000.

Williams, Robert L.; and Dunham, George. Drug dispensing apparatus. 3,917,045, Cl. 194-4.00C.

Williams, Zelmer L., to H.A.S. Investments, Inc. (Entire). Wiper for windshields. 3,916,473, Cl. 15-250.040.

Willis, Frank Marsden: *See—*
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Willis, Irving; and Walter, Bernd H. Method and apparatus for coded, self-service transfer of articles. 3,917,112, Cl. 221-1.000.

Willis, Wilfred Ernest: *See—*
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Wilson, Martin, to United States Borax & Chemical Corporation. Flotation of boric acid from sodium sulfate obtained during the processing of borate ores. 3,917,801, Cl. 423-283.000.

Wilson, Robert Neil, to Illinois Tool Works Inc. Fasteners. 3,916,757, Cl. 85-43.000.

Windings, Inc.: *See—*
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Winkler, Hans-Werner, to Siemens Aktiengesellschaft. X-ray diagnosis apparatus for feeding an x-ray tube having a rotary anode. 3,917,949, Cl. 250-402.000.

Winter, George R., III, to Universal Oil Products Company. Adsorbent treating process for both a liquid and a gaseous hydrocarbon stream. 3,917,733, Cl. 260-674.0SA.

Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., to Firmenich & Cie. Flavoring agent. 3,917,871, Cl. 426-536.000.

Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., to Firmenich & Cie. Flavoring agent. 3,917,872, Cl. 426-537.000.

Winter, Werner; Thiel, Max; Stach, Kurt; Schaumann, Wolfgang; and Roesch, Androniki, to Boehringer Mannheim GmbH. 9-(14-Phenylpiperazino)-alkyl)-adenines. 3,917,596, Cl. 260-252.000.

Winters, Robert, to Sterndent Corporation. Mixing container for dental materials. 3,917,062, Cl. 206-219.000.

Wisdom, Ronald David: *See—*
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Wissel, Francis A.: *See—*
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Wodrich, Donald D., to Atlantic Richfield Company. Method for decreasing radiation hazard in transporting radioactive material. 3,917,953, Cl. 250-506.000.

Wohlwend, Donald M.; and Wohlwend, Maurice, to HED Corporation. Vibratory compactor. 3,917,426, Cl. 404-133.000.

Wohlwend, Maurice: *See—*
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Wolf, Jack D., to Mallory Composites. Method of conforming a flexible self-supporting means to the surface contour of a substrate. 3,916,506, Cl. 428-457.000.

Wolf, Jack D.: *See—*
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Wolf, Karlheinz: *See—*
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Wolf, Kurt: *See—*
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Wolfe, James Richard, Jr.: *See—*
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Wolfe, William P., to Raymond Lee Organization, The, a part interest. Bowstring releasing device. 3,916,868, Cl. 124-35.00A.

Wolford, Lionel T.; Newcombe, Jack; and Dotson, Anderson O., Jr., to Cities Service Company. Brominated tricyclic imide flame retardants. 3,917,642, Cl. 260-326.00C.

Wong, Carl Y.; and Murphy, William L., to Pillsbury Company, The. Refrigerated corn bread dough. 3,917,856, Cl. 426-94.000.

Wood, Dennis E., to Rondo Machine Corporation. Random fiber webs and method of making same. 3,917,448, Cl. 8-125.000.

Wood, Hamish Christopher Swan; Stuart, Alexander; Curran, Adrian Charles Ward; and Al-Hassan, Saieba, to Burroughs Wellcome Co. Nitroso halides. 3,917,674, Cl. 260-488.00F.

Wood, Prentice J., to Mead Corporation, The. Article carrier. 3,917,058, Cl. 206-181.000.

Wood, Prentice J., to Mead Corporation, The. Article carrier. 3,917,059, Cl. 206-187.000.

Wood, Prentice J., to Mead Corporation, The. Article carrier. 3,917,060, Cl. 206-187.000.

Woodruff, Roy J. Method for forming holes in earth and setting subterranean structures therein. 3,916,634, Cl. 61-53.740.

Woods, Edward J.: *See—*
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Woodward, James O., to TRW Inc. Cold forming waveguide bending tool. 3,916,666, Cl. 72-388.000.

Woog, Heinrich; and Rothe, Werner, to Boehringer Manheim GmbH. Compositions and method for diagnosing diseases of the pancreas. 3,917,812, Cl. 424-7.000.

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Wright, Alan C.; and Chang, Hsien-Dao, to N L Industries, Inc. Hydrocarbon conversion catalysts and precursors thereof. 3,917,541, Cl. 252-441.000.

Wright, Harold A., to Arco Polymers, Inc. Photodegradable styrene polymer foams containing a hydrocarbon photosensitizer. 3,917,545, Cl. 260-2.5HB.

Wright, Richard F.: *See—*
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Wunsch, Gerd: *See—*
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Wyard Industries, Inc.: *See—*
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Wydler, Robert; and Sommer, Gerd R., to Maag Gear Wheel & Machine Company Limited. Methods of and means for producing helically toothed gears. 3,916,569, Cl. 51-33.00W.

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Xmris, Pavel; and Franco, Nicholas B. Electrostatic precipitator. 3,917,470, Cl. 55-139.000.

Yabuta, Masahiro, to Shima Sdea Center Company Limited. Glove knitting method. 3,916,647, Cl. 66-65.000.

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Yamabe, Masahiro: *See—*
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Yamada, Seibi; and Ishida, Kinyu, to Teijin Limited. Draw-texturing apparatus. 3,916,609, Cl. 57-34.0HS.

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Yanagisawa, Yuzuru; Ohgoshi, Akio; Yamanaka, Akira; and Muramoto, Shoichi, to Sony Corporation. Multi-position indicator display tube. 3,917,972, Cl. 313-519.000.

Yanase, Shigeru; and Katsura, Katsutoshi, to Daito Mokko Co., Ltd. Cabinet or folk art house half japanese and half western with sound unit installed therein. 3,917,283, Cl. 274-2.000.

Yancey, Paul J., to Union Carbide Corporation. Method of producing sodium beta-alumina single crystals. 3,917,462, Cl. 23-301.0SP.

Yasue, Masayuki; Saito, Sizuo; Shimojo, Sumio; and Shiode, Kazuhisa, to Sumitomo Chemical Company, Ltd. Method for producing anhydrous sodium dithionite. 3,917,807, Cl. 423-515.000.

Yates, Donald B.; and McNally, George S., to Pullman Incorporated. Brake rigging for railway cars. 3,917,025, Cl. 188-52.000.

Yates, James E., to Continental Oil Company. Process for condensation of alcohols. 3,917,722, Cl. 260-642.00C.

Yeda Research & Development Co., Ltd.: *See—*
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Yokogawa Electric Works, Ltd.: *See—*
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Yokosuka, Akira. Channel indicator device for television receiving sets. 3,916,819, Cl. 116-124.100.

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Youmans, Albert P., to Signetics Corporation. Encapsulated beam lead construction for semiconductor device and assembly and method. 3,918,079, Cl. 357-49.000.
Young, Einar T., to Sun Oil Company of Pennsylvania. Snap action transfer pinion. 3,916,713, Cl. 74-411.000.
Yourkievitz, David T., to Acme-Cleveland Corporation. Adjustable stock feed. 3,917,143, Cl. 226-141.000.
Yovanovich, Joseph T. Apparatus for producing stock of synthetic thermoplastic material by continuous molding. 3,917,439, Cl. 425-4.00C.
Yu, William Heng-Sen: *See*—
White, Edward Louis; Robertson, William Ernest; and Yu, William Heng-Sen, 3,917,804.
Yueh, Mao H., to General Mills Chemicals, Inc. Protein conditioner. 3,917,816, Cl. 424-61.000.
Yuhos, John R.: *See*—
Carmien, Joseph Allen; and Yuhos, John R., 3,917,421.
Zagoroff, Dimiter S. Heat gun. 3,917,442, Cl. 431-351.000.
Zajac, Ronald E., to Windings, Inc. Arrangement for doffing packages wound on a spindle carrying a mandrel. 3,917,181, Cl. 242-18.00R.
Zakrevsky, Stanislav Ivanovich: *See*—
Volkov, Igor Vladimirovich; Esibian, Eduard Migranovich; Alexandrov, Mikhail Mikhailovich; Zakrevsky, Stanislav Ivanovich; and Zhukovsky, Petr Grigorievich, 3,917,992.
Zanetti, Guido: *See*—
Furlenmeier, Andre; Lanz, Paul; Vogler, Karl, deceased; and Zanetti, Guido, 3,917,584.
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Zdanys, John, to CTS Corporation. Variable resistance control and method of assemblying the same. 3,918,023, Cl. 338-180.000.
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Zhukovsky, Petr Grigorievich: *See*—
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Zobel, Siegfried: *See*—
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Zoecon Corporation: *See*—
Carney, Robert L., 3,917,662.
Zucker, Fredric E.; Storace, Anthony; and Sette, Paul R., to Pitney-Bowes, Inc. High speed weighing scale. 3,917,012, Cl. 177-170.000.
Zugel, Martin J., to Cyclo Index Corporation. Clamping device for couplings. 3,917,424, Cl. 403-287.000.
Zwerenz, Carl Maria, to Upjohn Company, The. Operating mechanism for a motor vehicle. 3,916,719, Cl. 74-478.000.

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER TRIAL VOLUNTARY PROTEST PROGRAM

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B 24,017	3,914,140	Oct. 21, 1975	B 349,948	3,914,557	Oct. 21, 1975
B 24,018	3,914,206	Oct. 21, 1975	B 350,219	3,917,802	Nov. 4, 1975
B 64,868	3,914,141	Oct. 21, 1975	B 350,245	3,914,331	Oct. 21, 1975
B 78,331	3,914,142	Oct. 21, 1975	B 350,843	3,915,461	Oct. 28, 1975
B 112,422	3,913,484	Oct. 21, 1975	B 351,055	3,914,074	Oct. 21, 1975
B 150,560	3,913,654	Oct. 21, 1975	B 351,218	3,914,186	Oct. 21, 1975
B 176,995	3,915,773	Oct. 28, 1975	B 351,421	3,914,733	Oct. 21, 1975
B 198,810	3,916,043	Oct. 28, 1975	B 351,493	3,914,758	Oct. 21, 1975
B 207,272	3,914,123	Oct. 21, 1975	B 351,535	3,915,239	Oct. 28, 1975
B 211,786	3,914,300	Oct. 21, 1975	B 359,540	3,915,235	Oct. 28, 1975
B 220,683	3,914,471	Oct. 21, 1975	B 351,672	3,914,000	Oct. 21, 1975
B 222,188	3,914,739	Oct. 21, 1975	B 351,735	3,913,385	Oct. 21, 1975
B 251,109	3,914,148	Oct. 21, 1975	B 351,863	3,914,700	Oct. 21, 1975
B 251,635	3,914,149	Oct. 21, 1975	B 351,926	3,914,133	Oct. 21, 1975
B 254,211	3,917,677	Nov. 4, 1975	B 351,939	3,913,480	Oct. 21, 1975
B 258,687	3,914,221	Oct. 21, 1975	B 352,934	3,913,692	Oct. 21, 1975
B 261,378	3,913,468	Oct. 21, 1975	B 353,317	3,916,446	Nov. 4, 1975
B 262,378	3,914,410	Oct. 21, 1975	B 353,546	3,913,273	Oct. 21, 1975
B 265,727	3,914,479	Oct. 21, 1975	B 354,296	3,914,580	Oct. 21, 1975
B 265,862	3,915,915	Oct. 28, 1975	B 354,889	3,913,204	Oct. 21, 1975
B 269,673	3,914,377	Oct. 21, 1975	B 354,979	3,914,251	Oct. 21, 1975
B 276,271	3,916,028	Oct. 28, 1975	B 355,269	3,914,561	Oct. 21, 1975
B 276,560	3,916,030	Oct. 28, 1975	B 355,510	3,913,704	Oct. 21, 1975
B 278,991	3,914,469	Oct. 21, 1975	B 357,057	3,913,738	Oct. 21, 1975
B 282,081	3,913,483	Oct. 21, 1975	B 357,402	3,914,180	Oct. 21, 1975
B 284,297	3,913,722	Oct. 21, 1975	B 358,244	3,913,411	Oct. 21, 1975
B 285,796	3,914,303	Oct. 21, 1975	B 359,174	3,914,117	Oct. 21, 1975
B 286,499	3,914,129	Oct. 21, 1975	B 359,946	3,914,132	Oct. 21, 1975
B 287,164	3,914,139	Oct. 21, 1975	B 359,947	3,914,653	Oct. 21, 1975
B 288,627	3,916,179	Oct. 28, 1975	B 360,296	3,916,720	Nov. 4, 1975
B 289,471	3,917,184	Nov. 4, 1975	B 360,719	3,915,715	Oct. 28, 1975
B 292,054	3,915,877	Oct. 28, 1975	B 361,569	3,914,554	Oct. 21, 1975
B 292,126	3,914,465	Oct. 21, 1975	B 361,734	3,915,764	Oct. 28, 1975
B 292,140	3,914,340	Oct. 21, 1975	B 362,589	3,914,012	Oct. 21, 1975
B 293,437	3,913,414	Oct. 21, 1975	B 363,892	3,913,395	Oct. 21, 1975
B 294,579	3,916,737	Nov. 4, 1975	B 364,022	3,913,499	Oct. 21, 1975
B 294,673	3,916,023	Oct. 28, 1975	B 364,163	3,916,092	Oct. 28, 1975
B 295,674	3,916,107	Oct. 28, 1975	B 364,241	3,916,668	Nov. 4, 1975
B 299,267	3,917,106	Nov. 4, 1975	B 365,834	3,914,702	Oct. 21, 1975
B 303,702	3,914,131	Oct. 21, 1975	B 365,855	3,917,258	Nov. 4, 1975
B 305,417	3,915,882	Oct. 28, 1975	B 366,589	3,914,719	Oct. 21, 1975
B 306,938	3,916,050	Oct. 28, 1975	B 367,021	3,914,752	Oct. 21, 1975
B 307,677	3,915,276	Oct. 28, 1975	B 367,661	3,914,158	Oct. 21, 1975
B 309,207	3,914,743	Oct. 21, 1975	B 368,392	3,913,812	Oct. 21, 1975
B 309,756	3,914,136	Oct. 21, 1975	B 368,397	3,914,677	Oct. 21, 1975
B 313,900	3,915,932	Oct. 28, 1975	B 369,997	3,913,533	Oct. 21, 1975
B 315,731	3,914,108	Oct. 21, 1975	B 371,805	3,914,433	Oct. 21, 1975
B 316,239	3,913,546	Oct. 21, 1975	B 373,428	3,915,511	Oct. 28, 1975
B 318,195	3,915,699	Oct. 28, 1975	B 376,504	3,914,570	Oct. 21, 1975
B 318,618	3,915,365	Oct. 28, 1975	B 376,799	3,913,955	Oct. 21, 1975
B 318,745	3,916,571	Nov. 4, 1975	B 377,833	3,913,884	Oct. 21, 1975
B 319,339	3,916,056	Oct. 28, 1975	B 377,869	3,917,002	Nov. 4, 1975
B 320,603	3,915,571	Oct. 28, 1975	B 379,172	3,914,379	Oct. 21, 1975
B 321,101	3,917,163	Nov. 4, 1975	B 379,282	3,913,462	Oct. 21, 1975
B 322,564	3,914,373	Oct. 21, 1975	B 379,955	3,913,157	Oct. 21, 1975
B 323,191	3,914,566	Oct. 21, 1975	B 380,312	3,913,953	Oct. 21, 1975
B 323,203	3,916,165	Oct. 28, 1975	B 380,900	3,913,307	Oct. 21, 1975
B 328,164	3,914,703	Oct. 21, 1975	B 381,632	3,914,732	Oct. 21, 1975
B 328,200	3,916,031	Oct. 28, 1975	B 382,021	3,913,212	Oct. 21, 1975
B 328,205	3,914,106	Oct. 21, 1975	B 382,261	3,914,991	Oct. 28, 1975
B 328,210	3,914,275	Oct. 21, 1975	B 383,532	3,914,246	Oct. 21, 1975
B 328,870	3,916,486	Nov. 4, 1975	B 384,658	3,913,452	Oct. 21, 1975
B 330,828	3,913,589	Oct. 21, 1975	B 384,773	3,915,416	Oct. 28, 1975
B 331,417	3,914,157	Oct. 21, 1975	B 385,210	3,913,406	Oct. 21, 1975
B 331,557	3,916,577	Nov. 4, 1975	B 387,331	3,913,701	Oct. 21, 1975
B 331,895	3,916,403	Oct. 28, 1975	B 387,761	3,914,245	Oct. 21, 1975
B 336,652	3,914,211	Oct. 21, 1975	B 389,070	3,914,171	Oct. 21, 1975
B 337,442	3,913,658	Oct. 21, 1975	B 389,285	3,914,631	Oct. 21, 1975
B 337,703	3,914,690	Oct. 21, 1975	B 389,639	3,914,626	Oct. 21, 1975
B 341,579	3,913,363	Oct. 21, 1975	B 389,932	3,913,268	Oct. 21, 1975
B 343,506	3,916,021	Oct. 28, 1975	B 389,933	3,913,267	Oct. 21, 1975
B 345,060	3,916,018	Oct. 28, 1975	B 390,679	3,913,668	Oct. 21, 1975
B 345,384	3,916,146	Oct. 28, 1975	B 390,732	3,913,878	Oct. 21, 1975
B 345,422	3,914,392	Oct. 21, 1975	B 391,184	3,914,214	Oct. 21, 1975
B 345,567	3,913,985	Oct. 21, 1975	B 391,210	3,914,220	Oct. 21, 1975
B 346,165	3,913,293	Oct. 21, 1975	B 391,437	3,915,416	Oct. 28, 1975
B 346,210	3,916,142	Oct. 28, 1975	B 391,675	3,916,017	Oct. 28, 1975
B 346,350	3,915,824	Oct. 28, 1975	B 392,696	3,916,175	Oct. 28, 1975
B 346,585	3,913,820	Oct. 21, 1975	B 392,732	3,914,903	Oct. 21, 1975
B 346,901	3,915,583	Oct. 28, 1975	B 392,753	3,916,341	Oct. 28, 1975
B 348,495	3,914,654	Oct. 21, 1975	B 392,894	3,914,763	Oct. 21, 1975
B 348,558	3,914,109	Oct. 21, 1975	B 393,163	3,914,535	Oct. 21, 1975
B 349,141	3,915,363	Oct. 28, 1975	B 393,970	3,914,638	Oct. 21, 1975
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B 349,231	3,915,831	Oct. 28, 1975	B 394,300	3,914,159	Oct. 21, 1975
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B 395,889	3,913,190	Oct. 21, 1975	B 415,113	3,915,717	Oct. 28, 1975
B 396,025	3,913,869	Oct. 21, 1975	B 415,124	3,915,944	Oct. 28, 1975
B 397,527	3,913,488	Oct. 21, 1975	B 415,847	3,914,208	Oct. 21, 1975
B 397,990	3,914,848	Oct. 28, 1975	B 418,302	3,913,252	Oct. 21, 1975
B 398,262	3,913,481	Oct. 21, 1975	B 420,016	3,914,572	Oct. 21, 1975
B 398,597	3,913,743	Oct. 21, 1975	B 421,026	3,914,785	Oct. 21, 1975
B 399,292	3,914,810	Oct. 28, 1975	B 421,797	3,914,023	Oct. 21, 1975
B 399,766	3,915,667	Oct. 28, 1975	B 425,035	3,914,025	Oct. 21, 1975
B 400,310	3,915,507	Oct. 28, 1975	B 425,539	3,916,742	Nov. 4, 1975
B 402,555	3,914,688	Oct. 21, 1975	B 425,541	3,914,051	Oct. 21, 1975
B 403,140	3,913,486	Oct. 21, 1975	B 428,177	3,914,624	Oct. 21, 1975
B 403,355	3,913,352	Oct. 21, 1975	B 433,587	3,914,567	Oct. 21, 1975
B 403,990	3,914,684	Oct. 21, 1975	B 437,172	3,913,251	Oct. 21, 1975
B 403,996	3,916,016	Oct. 28, 1975	B 437,195	3,914,618	Oct. 21, 1975
B 404,437	3,915,200	Oct. 28, 1975	B 438,053	3,916,913	Oct. 28, 1975
B 405,136	3,915,565	Oct. 28, 1975	B 441,024	3,913,629	Oct. 21, 1975
B 405,137	3,915,566	Oct. 28, 1975	B 441,416	3,913,851	Oct. 21, 1975
B 405,360	3,913,403	Oct. 21, 1975	B 442,280	3,914,054	Oct. 21, 1975
B 406,065	3,914,199	Oct. 21, 1975	B 445,471	3,914,711	Oct. 21, 1975
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LIST OF DEFENSIVE PUBLICATIONS

APPLICANTS TO WHOM

DEFENSIVE PUBLICATIONS WERE ISSUED ON THE 4TH DAY OF NOVEMBER, 1975

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

Beretvas, Thomas, H. E. Lippman, J. L. Sandorn, and R. L. Taylor, to International Business Machines Corp. Rules driven data management process. T940,012, 11–4–75, Cl. 444—1.

Brechling, George E., W. F. Colton, R. R. Marshall, and W. H. Elder, to International Business Machines Corp. Automatic circuit generation process and apparatus. T940,020, 11–4–75, Cl. 444—1.

Brown, Paul J., and R. L. Carmier, to International Business Machines Corp. Input/output system with channel groups and dynamic sharing of I/O devices. T940,021, 11–4–75, Cl. 340—172.5.

Carmier, Roger L.: *See*—
Brown, Paul J., and Carmier. T940,021.

Chamberlin, Donald D., S. H. Fuller, and L. Ying-Wu Lui, to International Business Machines Corp. Resource balancing system for multiprogramming systems with a virtual memory and paging allocation. T940,017, 11–4–75, Cl. 444—1.

Chamberlin, Donald D., S. H. Fuller, and L. Ying-Wu Liu, to International Business Machines Corp. Page allocation strategy for multiprogramming systems with virtual memory. T940,018, 11–4–75, Cl. 444—1.

Coleman, Charles D., to International Business Machines Corp. Memory size independent data processing system and method. T940,003, 11–4–75, Cl. 444—1.

Colton, William F.: *See*—
Brechling, George E., Colton, Marshall, and Elder. T940,-020.

Costa, Donald J., H. D. Entz, G. E. Espersen, E. A. Lane, E. H. Mashburn, J. B. Mumford, E. H. Nelson, F. J. Fendt, and R. W. Wright, to International Business Machines Corp. Method and apparatus for producing customized and user-added programming information. T940,002, 11–4–75, Cl. 444—1.

Crane, Grant, W. A. Wilson, and E. L. Kay, to The Firestone Tire & Rubber Co. Post-calcination of vulcanized-rubber char. T940,011, 11–4–75, Cl. D423—449.

Dixon, Ronald L. Laminar flow device for calibrating a tobacco smoke filter rod pressure drop testing apparatus and method for making device. T940,004, 11–4–75, Cl. 73—3.

Du Pont de Nemours, E. I., & Co.: *See*—
Vasta, Joseph A. T940,005.

Elder, Walter H.: *See*—
Brechling, George E., Colton, Marshall, and Elder. T940,-020.

Ells, Bryce F., and J. M. Wrenn, to International Business Machines Corp. Method and apparatus for producing customized programming information. T940,001, 11–4–75, Cl. 444—1.

Entz, Harry D.: *See*—
Costa, Donald J., Entz, Espersen, Lane, Mashburn, Mumford, Nelson, Fendt, and Wright. T940,002.

Espersen, George E.: *See*—
Costa, Donald J., Entz, Espersen, Lane, Mashburn, Mumford, Nelson, Fendt, and Wright. T940,002.

Fendt, Frank J.: *See*—
Costa, Donald J., Entz, Espersen, Lane, Mashburn, Mumford, Nelson, Fendt, and Wright. T940,002.

Firestone Tire & Rubber Co., The: *See*—
Crane, Grant, Wilson, and Kay. T940,011.

Fuller, Samuel H.: *See*—
Chamberlin, Donald D., Fuller, and Lui. T940,017–8.

Hicks, Gordon C., and F. E. Lancaster, Jr. Pipe reactor-continuous ammoniator process for production of granular phosphates. T940,023, 11–4–75, Cl. 71—34.

Ho, Chung W., to International Business Machines Corp. Network design process using multiple performance functions. T940,013, 11–4–75, Cl. 444—1.

Ho, Chung W., and T. R. Scott, to International Business Machines Corp. Transmission line analysis and design process. T940,015, 11–4–75, Cl. 444—1.

International Business Machines Corp.: *See*—
Beretvas, Thomas, Lippman, Sandorn, and Taylor. T940,-012.
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Hicks, Gordon C., and Lancaster, Jr. T940,023.

Lane, Edward A.: *See*—
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Larsen, John W. Conversion of waste rubber to fuel and other useful products. T940,007, 11–4–75, Cl. 44—1.

Larson, Lawrence E., to International Business Machines Corp. Channel program translation. T940,019, 11–4–75, Cl. 444—1.

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Liu, Leonard Ying-Wu: *See*—
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Marshall, Rita R.: *See*—
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Mashburn, Ernest H.: *See*—
Costa, Donald J., Entz, Espersen, Lane, Mashburn, Mumford, Nelson, Fendt, and Wright. T940,002.

Morie, Gerald P., and C. H. Sloan. Plasticizer blends for tobacco smoke filter rods and filter rods bonded by such blends. T940,006, 11–4–75, Cl. 131—267.

Mumford, Jack B.: *See*—
Costa, Donald J., Entz, Espersen, Lane, Mashburn, Mumford, Nelson, Fendt, and Wright. T940,002.

Nelson, Edward H.: *See*—
Costa, Donald J., Entz, Espersen, Lane, Mashburn, Mumford, Nelson, Fendt, and Wright. T940,002.

Nelson, Kyler F., to Xerox Corp. Imaging device. T940,016, 11–4–75, Cl. 96—1.5.

Nichols, David E., and E. W. Sawyer, Jr. Nitrogen suspension. T940,014, 11–4–75, Cl. 71—29.

Oden, Peter H., R. L. Russo, and P. K. Wolff, Sr. Automated logic mapping system. T940,008, 11–4–75, Cl. 444—1.

Radkowsky, Alvin, to United States of America, Atomic Energy Commission. Measurement of burnable poison absorptions and critical assemblies. T940,009, 11–4–75, Cl. 176—19.

Rodda, John C., to Xerox Corp. Pressurized and filtered xerographic system. T940,022, 11–4–75, Cl. 355—3.

Russo, Roy L.: *See*—
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Sandorn, Jere L.: *See*—
Beretvas, Thomas, Lippman, Sandorn, and Taylor. T940,-012.

Sawyer, Edgar W., Jr.: *See*—
Nichols, David E., and Sawyer, Jr. T940,014.

Scott, Terrence R.: *See*—
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Simcox, William J. Edible emulsifiers and process for making same. T940,010, 11–4–75, Cl. 426—62.

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Atomic Energy Commission: *See*—
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Vasta, Joseph A., to E. I. du Pont de Nemours & Co. Versatile water/solvent soluble polymer and coating composition of the polymer. T940,005, 11–4–75, Cl. 260—29.4.

Wilson, Woodrow A.: *See*—
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Wolff, Peter K., Sr.: *See*—
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Wrenn, Joyce M.: *See*—
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Wright, Richard W.: *See*—
Costa, Donald J., Entz, Espersen, Lane, Mashburn, Mumford, Nelson, Fendt, and Wright. T940,002.

Xerox Corp.: *See*—
Nelson, Kyler F. T940,016.
Rodda, John C. T940,022.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 4TH DAY OF NOVEMBER, 1975

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Alburger, James R. Penetrant inspection process and compositions. Re. 28,605, Cl. 106-19.000.

B & K Machinery International Limited: *See*—
Clark, Anthony Philip, Re. 28,602.

Bell Telephone Laboratories, Incorporated: *See*—
Richards, Philip Charles, Re. 28,607.

Clark, Anthony Philip, to B & K Machinery International Limited. Differential drive for tension rollers. Re. 28,602, Cl. 226-25.000.

Dionys Hofmann, GmbH Maschinenfabrik: *See*—
Hofmann, Dionys, Re. 28,601.

Du Pont de Nemours, E. I., and Company: *See*—
Ikeda, Richard Masayoshi; and Ostapchenko, George Joseph, Re. 28,606.

Farr, Glyn P. R., to Girling Limited. Load transmitting struts. Re. 28,603, Cl. 188-196.00R.

General Electric Company: *See*—
Kotski, Edward J., Re. 28,604.

Girling Limited: *See*—
Farr, Glyn P. R., Re. 28,603.

Hofmann, Dionys, to Dionys Hofmann, GmbH Maschinenfabrik. Method and apparatus for automatic balancing of motor vehicle wheels. Re. 28,601, Cl. 73-468.000.

Ikeda, Richard Masayoshi; and Ostapchenko, George Joseph, to Du Pont de Nemours, E. I., and Company. Filled, biaxially oriented, polymeric film. Re. 28,606, Cl. 428-155.000.

Kotski, Edward J., to General Electric Company. Gas shield for load-break cable terminations. Re. 28,604, Cl. 339-111.000.

Lemelson, Jerome H. Extrusion die apparatus. Re. 28,600, Cl. 72-265.000.

Ostapchenko, George Joseph: *See*—
Ikeda, Richard Masayoshi; and Ostapchenko, George Joseph, Re. 28,606.

Richards, Philip Charles, to Bell Telephone Laboratories, Incorporated. PBX In-dialing. Re. 28,607, Cl. 179-18.0ES.

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Anderson, Frederic W., to The Burchell Nursery, Inc. Plum tree. 3,797, 11–4–75, Cl. 38.

Boll, Herschel L. Strawberry plant. 3,798, 11–4–75, Cl. 48.

Burchell Nursery, Inc., The: *See*—
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Moore, Ralph S. Miniature rose plant. 3,800, 11–4–75, Cl. 8.

Nobbio, Giacomo. Perpetual flowering carnation plant. 3,799, 11–4–75, Cl. 73.

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Ainslie, Dianne B., to Eastman Kodak Co. Motion picture projector. 237,544, 11–4–75, Cl. D61—1.

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213	3,916,459

CLASS 5

9R	3,916,462
13	3,916,460
66	3,916,461
264R	3,916,463
351	3,916,464

CLASS 8

52	3,917,446
92	3,917,447
125	3,917,448
165	3,917,449

CLASS 9

2S	3,916,466
	3,916,468
8R	3,916,467

CLASS 13

27	3,917,896

CLASS 15

88	3,916,469
98	3,916,470
104.3R	3,916,471
235.6	3,916,472
250.04	3,916,473
250.42	3,916,474
256.51	3,916,475
377	3,916,476

CLASS 16

94D	3,916,477
116R	3,916,478
142	3,916,479
159	3,916,480
166	3,916,481

CLASS 17

23	3,916,482
32	3,916,483
52	3,916,484

CLASS 19

65R	3,916,485
66R	3,916,486

CLASS 21

94	3,917,450

CLASS 23

230B	3,917,451
	3,917,452
	3,917,453
232R	3,917,454
253R	3,917,455
254R	3,917,456
259.2	3,917,457
262	3,917,458
273V	3,917,459
283	3,917,460
288A	3,917,461
301SP	3,917,462

CLASS 24

73P	3,916,703
122.6	3,916,487
262R	3,916,488
279	3,916,489

CLASS 26

55R	3,916,492
57R	3,916,491

CLASS 28

1.4	3,916,493
4R	3,916,494

CLASS 29

25.35	3,916,490
156.4R	3,916,495
157.1R	3,916,496
182.8	3,916,497
	3,917,463
196.6	3,917,464
200D	3,916,498
208C	3,916,499
240	3,916,500
437	3,916,501
450	3,916,503
451	3,916,502
455	3,916,504
456	3,916,505
526	3,916,507
574	3,916,508
578	3,916,509
583	3,916,510
603	3,916,511
622	3,916,512
625	3,916,513
	3,916,514
626	3,916,515
628	3,916,516
	3,916,517
629	3,916,518

CLASS 30

97	3,916,519
132	3,916,521
277	3,916,520
346.51	3,916,522
346.53	3,916,523

CLASS 32

11	3,916,524
12	3,916,525
14A	3,916,526
17	3,916,527

CLASS 33

125C	3,916,528
174D	3,916,529
241	3,916,530
333	3,916,531

CLASS 34

5	3,916,532

CLASS 35

10.4	3,916,533
11	3,916,534
17	3,916,535
25	3,916,536
29E	3,916,537

CLASS 36

11.5	3,916,538
51	3,916,539

CLASS 37

2R	3,916,540
8	3,916,541
43R	3,916,542
93	3,916,543
110	3,916,544
126AB	3,916,545

CLASS 38

1B	3,916,546

CLASS 40

104.02	3,916,547
106.3	3,916,548
152.1	3,916,549
300	3,916,550

CLASS 42

67	3,916,551
87	3,916,552

CLASS 43

3	3,916,553
17	3,916,554
27.4	3,916,555
42.06	3,916,556
43.12	3,916,557
65	3,916,558

CLASS 44

2	3,917,465
62	3,917,466

CLASS 46

1R	3,916,559
80	3,916,560
118	3,916,561
119	3,916,562

CLASS 47

33	3,916,563
48.5	3,916,564
58	3,916,565

CLASS 48

197R	3,917,467
199R	3,917,468

CLASS 49

7	3,916,566
28	3,916,567

CLASS 51

8R	3,916,568
33W	3,916,569
95WH	3,916,570
101R	3,916,571
105LG	3,916,572
118	3,916,573
124L	3,916,574
163	3,916,575
165.74	3,916,576
206P	3,916,579
209R	3,916,580
283	3,916,581
288	3,916,582
298	3,916,583
308	3,916,584
309	3,916,585
368	3,916,586

CLASS 52

27	3,916,587
30	3,916,588
81	3,916,589
125	3,916,590
167	3,916,578
187	3,916,591
252	3,916,592
489	3,916,577
686	3,916,593
745	3,916,594
747	3,916,595
758F	3,916,596

CLASS 53

14	3,916,597
55	3,916,598
76	3,916,599
142	3,916,600
204	3,916,601
329	3,916,602
384	3,916,603

CLASS 54

44	3,916,604

CLASS 55

73	3,917,469
139	3,917,470
267	3,917,471
282	3,917,472
310	3,917,473
332	3,917,474

CLASS 56

13.3	3,916,605
13.4	3,916,606
17.5	3,916,607
202	3,916,608

CLASS 57

34HS	3,916,609
71	3,916,610
140BY	3,916,611

CLASS 58

23BA	3,916,613
23R	3,916,612
59	3,916,614
68	3,916,615

CLASS 59

85	3,916,616

CLASS 60

39.02	3,916,617
39.47	3,916,618
39.65	3,916,619
226A	3,916,620
244	3,916,621
277	3,916,622
288	3,916,623
394	3,916,624
421	3,916,625
496	3,916,626
721	3,916,627

CLASS 61

28	3,916,628
41A	3,916,629
42	3,916,630
45D	3,916,631
46	3,916,632
46.5	3,916,633
53	3,916,635
53.74	3,916,634
72.7	3,916,636

CLASS 62

136	3,916,637
238	3,916,638
239	3,916,639
266	3,916,640
292	3,916,641
	3,916,642
410	3,916,643
428	3,916,644

CLASS 66

1R	3,916,645
50R	3,916,646
65	3,916,647
75	3,916,648
84A	3,916,649
111	3,916,650

CLASS 68

5E	3,916,651
13R	3,916,652
15	3,916,653

CLASS 70

56	3,916,654
145	3,916,655
148	3,916,656
338	3,916,657
417	3,916,658
456R	3,916,659

CLASS 71

34	3,917,475
67	3,917,476
76	3,917,477
90	3,917,478

CLASS 72

17	3,916,661
31	3,916,662
135	3,916,663
201	3,916,660
265	Re.28,600
274	3,916,664
306	3,916,665
379	3,916,669
	3,917,669
388	3,916,666
402	3,916,667
407	3,916,668

CLASS 73

15B	3,916,670
23.1	3,916,465
	3,916,671
30	3,916,672
37	3,916,673
61.1R	3,916,674
67.2	3,916,699
67.8R	3,916,675
67.8S	3,916,676
71.7	3,916,677
73	3,916,678
95	3,916,679
100	3,916,680
103	3,916,681
114	3,916,682
119A	3,916,683
151.5	3,916,684
152	3,916,685
158	3,916,686
160	3,916,687
178T	3,916,688
304C	3,916,689
355EM	3,916,690
361	3,916,691
422GC	3,916,692
423R	3,916,693
432R	3,916,694
	3,916,695
468	Re.28,601
484	3,916,696
504	3,916,697
518	3,916,698

CLASS 74

25	3,916,700
57	3,916,701
	3,916,702
84R	3,916,704
230.01	3,916,706
230.17A	3,916,705
230.17E	3,916,707
243R	3,916,708
253R	3,916,709
331	3,916,710
	3,916,714
360	3,916,711
410	3,916,712
411	3,916,713
414	3,916,715
461	3,916,716
471R	3,916,718
473R	3,916,717
478	3,916,719
492	3,916,720
501R	3,916,723
512	3,916,722
553	3,916,721
606R	3,916,724
	3,916,725
612	3,916,726
688	3,916,727
711	3,916,728
751	3,916,729
	3,916,730

CLASS 75

10R	3,917,479
26	3,917,480

CLASS 76

41	3,916,731

CLASS 81

3R	3,916,732
9.51	3,916,733
56	3,916,734
165	3,916,735
185	3,916,736

CLASS 82

11	3,916,737
18	3,916,738
36	3,916,739
56	3,916,740

CLASS 83

27	3,916,741
	3,916,742
86	3,916,743
175	3,916,744
311	3,916,745
666	3,916,746
698	3,916,747
699	3,916,748
835	3,916,749

CLASS 84

1.01	3,916,750
1.15	3,916,751
1.19	3,916,752
267	3,916,753
402	3,916,754

CLASS 85

5R	3,916,755
8.8	3,916,756
43	3,916,757

CLASS 86

44	3,916,758

CLASS 89

1.5E	3,916,760
1.814	3,916,759
8	3,916,761
33SF	3,916,762

CLASS 90

15.1	3,916,763

CLASS 91

235	3,916,764
307	3,916,765
411A	3,916,766
417	3,916,768

CLASS 92

86	3,916,771

CLASS 93

24	3,916,769
35SB	3,916,770

CLASS 96

1R	3,917,481
1.5	3,917,482
27R	3,917,483
48R	3,917,484
101	3,917,485

CLASS 98

38	3,916,772
40D	3,916,773
107	3,916,774

CLASS 99

277	3,916,775
503	3,916,776
533	3,916,777

CLASS 100

4	3,916,778
26	3,916,779
49	3,916,780
53	3,916,781
229A	3,916,782

CLASS 101

21	3,916,783
41	3,916,784
45	3,916,785
93.37	3,916,786
93.41	3,916,787
102	3,916,788
141	3,916,791
148	3,916,789
232	3,916,790

CLASS 102

38	3,916,792
	3,916,793
92.3	3,916,794
92.7	3,916,795

CLASS 104

26A	3,916,796
172B	3,916,797
247	3,916,798

CLASS 105

368B	3,916,799
377	3,916,800
486	3,916,801

CLASS 106

1	3,917,486
	3,917,487
19	Re.28,605
50	3,917,488
110	3,917,489

CLASS 108

27	3,916,802
51	3,916,803

CLASS 109

78	3,916,804

CLASS 110

7R	3,916,805
14	3,916,806
	3,916,807

CLASS 112

63	3,916,808

CLASS 114

68	3,916,809
124	3,916,810
125	3,916,811
230	3,916,812

CLASS 115

6	3,916,813
6.1	3,916,814

CLASS 116

63P	3,916,815
	3,916,816
70	3,916,817
	3,916,818
114R	3,916,821
124.1	3,916,819
124.2R	3,916,820

CLASS 118

49	3,916,822
63	3,916,823
224	3,916,824
303	3,916,825

629 3,916,826
637 3,916,827
3,916,828
3,916,829
3,916,830

CLASS 119

1 3,916,831
2 3,916,832
3,916,833
3 3,916,834
12 3,916,835
17 3,916,836
18 3,916,837
29 3,916,838
158 3,916,839

CLASS 122

32 3,916,841
3,916,843
3,916,844

CLASS 123

8.45 3,916,845
3,916,846
32EA 3,916,842
3,916,848
32SP 3,916,847
32ST 3,916,840
41.31 3,916,849
52M 3,916,850
73A 3,916,851
75B 3,916,852
97R 3,916,853
108 3,916,854
117R 3,916,855
119A 3,916,857
122AA 3,916,859
122AB 3,916,858
122R 3,916,860
139AW 3,916,856
139E 3,916,861
140MC 3,916,862
148R 3,916,863
191R 3,916,864
193P 3,917,133
197R 3,916,866
198DB 3,916,865

CLASS 124

16 3,916,867
35A 3,916,868

CLASS 126

110B 3,916,870
110R 3,916,869
271 3,916,871
375 3,916,872

CLASS 128

1R 3,916,873
3,916,874
2A 3,916,875
2.05R 3,916,877
2.06F 3,916,878
2.1M 3,916,876
12 3,916,879
3,916,880
16 3,916,881
24R 3,916,882
69 3,916,883
75 3,916,884
3,916,885
80E 3,916,886
132D 3,916,887
145.6 3,916,888
145.8 3,916,889
3,916,890
192 3,916,891
214R 3,916,892
218R 3,916,893
220 3,916,894
229 3,916,895
239 3,916,896
245 3,916,897
260 3,916,898
3,916,899
287 3,916,900
3,916,901
295 3,916,902
305.3 3,916,903
330 3,916,904
334R 3,916,905
344 3,916,906
345 3,916,907
346 3,916,908
354 3,916,909
3,916,910
400 3,916,911

CLASS 130

27T 3,916,912
30R 3,916,913

CLASS 131

10A 3,916,914
134 3,916,915
175 3,916,916

CLASS 132

9 3,916,917
11R 3,916,918
40 3,916,919
73 3,916,920
73.6 3,916,921

CLASS 133

3R 3,916,922

CLASS 134

57R 3,916,923
95 3,916,924
172 3,916,925

CLASS 135

26 3,916,927

CLASS 136

6F 3,917,490

CLASS 137

2 3,916,926
39 3,916,928
68 3,916,929
75 3,916,930
101 3,916,931
3,916,932
102 3,916,933
115 3,916,934
204 3,916,936
255 3,916,937
256 3,916,938
296 3,916,939
340 3,916,940
3,916,941
344 3,916,942
375 3,916,943
376 3,916,944
445 3,916,945
512.2 3,916,946
544 3,916,947
608 3,916,948
609 3,916,949
625.41 3,916,950
3,916,951
625.64 3,916,952

CLASS 138

129 3,916,953
149 3,916,954
155 3,916,955

CLASS 139

21 3,916,956
122R 3,916,935
123 3,916,957

CLASS 140

4 3,916,958
71.5 3,916,959

CLASS 141

1 3,916,960
46 3,916,961
108 3,916,962
198 3,916,963
283 3,916,964

CLASS 144

134R 3,916,965
309D 3,916,966

CLASS 148

1.5 3,917,491
12C 3,917,494
12E 3,917,492
3,917,493
187 3,917,495

CLASS 149

19.6 3,917,496

CLASS 150

52R 3,916,967

CLASS 152

353 3,916,968
354 3,916,969
379.1 3,916,970

CLASS 156

73.5 3,917,497
144 3,917,499
195 3,917,500
204 3,917,498
279 3,917,501
353 3,917,502
382 3,917,503
453 3,917,504
515 3,917,505
621 3,917,506

CLASS 157

1.24 3,916,971

CLASS 159

2E 3,917,507
47R 3,917,508

CLASS 160

135 3,916,972
178R 3,916,973
319 3,916,974
330 3,916,975

CLASS 164

37 3,916,976
52 3,916,977
3,916,978
57 3,916,979
82 3,916,980
159 3,916,981
206 3,916,982
3,916,983
278 3,916,984
281 3,916,985
332 3,916,986

CLASS 165

16 3,916,987
42 3,916,988
151 3,916,989
158 3,916,990
163 3,916,991

CLASS 166

224A 3,916,992
248 3,916,993
271 3,916,994
3,916,995
3,916,996
275 3,916,997
301 3,916,998
302 3,916,999

CLASS 168

4 3,917,000

CLASS 169

61 3,917,001

CLASS 172

9 3,917,002
44 3,917,003
328 3,917,004

CLASS 173

23 3,917,005

CLASS 174

15C 3,917,897
3,917,898
57 3,917,899
107 3,917,900
110P 3,917,901

CLASS 175

5 3,917,006
14 3,917,007
38 3,917,008
53 3,917,009
73 3,917,010
339 3,917,011

CLASS 176

39 3,917,509

CLASS 177

170 3,917,012

CLASS 178

6 3,917,902
6.6R 3,917,903

CLASS 179

2TV 3,917,904
6E 3,917,905
15FD 3,917,906
18AF 3,917,907
18BH 3,917,910
18ES Re.28,607
18FC 3,917,908
18HB 3,917,909
37 3,917,911
84VF 3,917,912
3,917,913
115R 3,917,914
175.2C 3,917,915
175.31R 3,917,916

CLASS 180

6.48 3,917,014
3,917,015
6.7 3,917,013
57 3,917,016
65R 3,917,017
79.2R 3,917,018
82C 3,917,019
93 3,917,020
114 3,917,021
127 3,917,022

CLASS 181

163 3,917,024

CLASS 182

129 3,917,026

CLASS 184

6.14 3,917,028
6.3 3,917,027

CLASS 187

29R 3,917,029

CLASS 188

1C 3,917,030
3,917,031
52 3,917,025
73.3 3,917,032
3,917,033
73.4 3,917,034
161 3,917,035
170 3,917,037
196R Re.28,603

CLASS 190

18A 3,917,038

CLASS 191

29DM 3,917,039

CLASS 192

4A 3,917,040
30W 3,917,041
45 3,917,036
84A 3,917,042
107R 3,917,043

CLASS 193

40 3,917,044

CLASS 194

4C 3,917,045
9T 3,917,046
74 3,917,047

CLASS 195

2 3,917,510
29 3,917,511
62 3,917,512
66R 3,917,513
80R 3,917,514
103.5R 3,917,515

CLASS 197

133P 3,917,048

CLASS 198

32 3,917,049
37 3,917,050
91 3,917,051
220BC 3,917,052
232 3,917,053
266 3,917,054
278 3,917,05:

CLASS 200

5A 3,917,917
6A 3,917,918
44 3,917,919
162 3,917,920
333 3,917,921

CLASS 202

227 3,917,516

CLASS 204

43P 3,917,517
95 3,917,518
108 3,917,519
129 3,917,520
149 3,917,521
159,15 3,917,522
195F 3,917,523
195R 3,917,524
290F 3,917,525

CLASS 206

44 3,917,056
104 3,917,057
181 3,917,058
187 3,917,059
3,917,060
3,917,061
219 3,917,062
221 3,917,063
277 3,917,064
326 3,917,065
386 3,917,066
387 3,917,067
444 3,917,068

CLASS 208

59 3,917,562
131 3,917,564
144 3,917,565
293 3,917,566

CLASS 209

74M 3,917,069
111.6 3,917,070
138 3,917,567
144 3,917,568

CLASS 210

21 3,917,569
23 3,917,526
31C 3,917,527
36 3,917,528
54 3,917,529
58 3,917,530
101 3,917,531
199 3,917,532
469 3,917,533
486 3,917,534

CLASS 211

64 3,917,071
167 3,917,072
178 3,917,073

CLASS 212

47 3,917,074

CLASS 213

8 3,917,075

CLASS 214

1QG 3,917,079
1D 3,917,076
1P 3,917,078
1R 3,917,077
6A 3,917,080
3,917,081
8.5D 3,917,082
38CA 3,917,083
83.26 3,917,084
83.3 3,917,085
83.36 3,917,092
84 3,917,086
3,917,087
130R 3,917,088
145 3,917,089
146.5 3,917,090
152 3,917,091
313 3,917,093
450 3,917,094

CLASS 215

1C 3,917,095
211 3,917,096
216 3,917,097
219 3,917,098
277 3,917,099
329 3,917,100

CLASS 219

243 3,917,922

CLASS 220

3.2 3,917,101
4F 3,917,102
6 3,917,103
18 3,917,104
22 3,917,105
23.83 3,917,106
65 3,917,107
66 3,917,108
85VS 3,917,109

CLASS 221

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20 3,917,113
251 3,917,114

CLASS 222

1 3,917,110
3,917,111
3 3,917,115
92 3,917,116
94 3,917,117
101 3,917,118
108 3,917,119
129 3,917,120
146HA 3,917,121
146HE 3,917,122
3,917,123
189 3,917,125
195 3,917,126
386 3,917,124
402.13 3,917,127
410 3,917,128
454 3,917,129
555 3,917,130
556 3,917,131
559 3,917,132

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14 3,917,135
42.03B 3,917,138
42.1F 3,917,136
45S 3,917,137

CLASS 225

96.5 3,917,139
100 3,917,140

CLASS 226

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38 3,917,142
97 3,917,141
141 3,917,143
195 3,917,144

CLASS 227

90 3,917,145

CLASS 228

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19 3,917,147
54 3,917,148
124 3,917,149
159 3,917,150
220 3,917,151

CLASS 229

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8 3,917,153
23R 3,917,154
31R 3,917,155
32 3,917,156
43 3,917,157
51TS 3,917,158
58 3,917,159
62 3,917,160

CLASS 235

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61.11C 3,917,925
61.6L 3,917,924
92CA 3,917,928
92GC 3,917,926
92TF 3,917,927
150.2 3,917,929
151.11 3,917,930
151.12 3,917,931
152 3,917,932
153AK 3,917,933
156 3,917,934
3,917,935
181 3,917,936
193 3,917,937

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23 3,917,162
34 3,917,163
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CLASS 239

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4 3,917,167
13 3,917,168
107 3,917,169
132.3 3,917,170
177 3,917,171
305 3,917,172
400 3,917,173
542 3,917,174

CLASS 240

7.1R 3,917,938
41SB 3,917,939
52.15 3,917,940
102R 3,917,941

CLASS 241

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55 3,917,176
57. 3,917,177
82.5 3,917,178
194 3,917,179
293 3,917,180

CLASS 242

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3,917,182
55.3 3,917,191
56R 3,917,183
56.8 3,917,184
68.5 3,917,185
71.8 3,917,186
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107.4 3,917,188
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191 3,917,190

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42D 3,917,192
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110B 3,917,198
118R 3,917,199

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20 3,917,201
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188 3,917,204
229 3,917,205
239 3,917,206
311 3,917,207
356 3,917,208
399 3,917,209
419 3,917,210
421 3,917,211
487 3,917,212
509 3,917,213

CLASS 249

18 3,917,214
23 3,917,215
48 3,917,216
183 3,917,217

CLASS 250

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211J 3,917,943
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301 3,917,945
307 3,917,946
360 3,917,947
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402 3,917,949
476 3,917,952
483 3,917,950
495 3,917,951
506 3,917,953
510 3,917,954
549 3,917,955
564 3,917,956
573 3,917,957

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127 3,917,221
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301.4R 3,917,539
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442 3,917,542
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2.5F 3,917,546
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18N 3,917,549
23EP 3,917,550
27BB 3,917,551
28.5B 3,917,607
28.5R 3,917,552
29.6AN 3,917,553
30.4A 3,917,554
31.4R 3,917,555
32.8SB 3,917,648
33.2R 3,917,556
33.6UA 3,917,557
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45.7S 3,917,559
45.75C 3,917,561
45.9NP 3,917,560
67FP 3,917,563
75TN 3,917,570
77.5AP 3,917,571
77.5R 3,917,572
78.5T 3,917,573
79.3MU 3,917,574
88.2R 3,917,575
94.7D 3,917,576
94.9R 3,917,577
112.5 3,917,578
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240.1 3,917,586
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3,917,588
3,917,590
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243R 3,917,589
244 3,917,592
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247.1L 3,917,593
247.2A 3,917,594
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256.4N 3,917,597
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268PC 3,917,599
268PH 3,917,598
268R 3,917,602
279R 3,917,603
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283SY 3,917,605
285 3,917,606
287P 3,917,608
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288CF 3,917,610
288R 3,917,611
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293.65 3,917,613
293.71 3,917,614
293.73 3,917,616
293.77 3,917,617
293.85 3,917,618
293.9 3,917,612
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294.8F 3,917,622
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294.8K 3,917,621
294.9 3,917,624
295AM 3,917,625
295.5A 3,917,626
296B 3,917,628
296H 3,917,629
296T 3,917,627
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307F 3,917,631
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309.2 3,917,635
309.5 3,917,636
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309.7 3,917,638
314.5 3,917,639
316 3,917,640
325 3,917,641
326C 3,917,642
326R 3,917,643
326S 3,917,644
326.13R 3,917,646
326.2 3,917,645
326.25 3,917,647
333 3,917,649
335 3,917,650
340.3 3,917,651
340.9 3,917,652
345.1 3,917,653
346.2R 3,917,654
346.8 3,917,655
349 3,917,656
397.4 3,917,657
397.5 3,917,658
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468H 3,917,667
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535P 3,917,686
537P 3,917,687
543F 3,917,688
552SC 3,917,689
553DA 3,917,690
555R 3,917,659
556AR 3,917,692
556F 3,917,691
561K 3,917,694
561N 3,917,693
562A 3,917,695
562R 3,917,696
563R 3,917,697
564G 3,917,698
566A 3,917,699
566R 3,917,700
569 3,917,701
570D 3,917,702
570.5P 3,917,703
570.6 3,917,704
571 3,917,680
583K 3,917,707
583M 3,917,705
3,917,706
586R 3,917,708
593A 3,917,709
593R 3,917,710
601R 3,917,711
3,917,712
602 3,917,713
607A 3,917,714
3,917,715
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613R 3,917,718
622R 3,917,719
635R 3,917,720
641 3,917,721
642C 3,917,722
646 3,917,723
653.1R 3,917,724
3,917,725
653.9 3,917,726
656R 3,917,727
3,917,728
658R 3,917,729
666B 3,917,730
668F 3,917,731
669R 3,917,732
674SA 3,917,733
3,917,734
677R 3,917,735
680E 3,917,736
683.43 3,917,738
683.65 3,917,739
683.9 3,917,737
857PG 3,917,740
859R 3,917,741
3,917,742
860 3,917,743
861 3,917,744
3,917,745
876B 3,917,746
879 3,917,747
880R 3,917,748
3,917,749
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940 3,917,751
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954 3,917,753
957 3,917,754
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34A 3,917,758
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3,917,770
29 3,917,776
35 3,917,771
41 3,917,761
3,917,772
3,917,777
44 3,917,773
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3,917,775
46.5 3,917,779
61 3,917,780
63 3,917,778
71 3,917,781
81 3,917,782
85 3,917,783
103 3,917,784
108 3,917,785
129 3,917,786
146 3,917,787
153 3,917,788
219 3,917,789
267 3,917,790
326 3,917,791
328 3,917,792
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34R 3,917,242
34T 3,917,240
41 3,917,243
CLASS 267
34 3,917,244
120 3,917,245
136 3,917,246
140 3,917,247
CLASS 269
23 3,917,248
58 3,917,249
CLASS 270
30 3,917,250
37 3,917,251
58 3,917,252
84 3,917,253
86 3,917,254
3,917,255
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133 3,917,259
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58 3,917,262
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32A 3,917,266
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38 3,917,287
59 3,917,288
74 3,917,289
75 3,917,290
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110 3,917,292
114 3,917,293
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11.13W 3,917,298
3,917,299
11.35K 3,917,296
11.35R 3,917,300
12K 3,917,301
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36C 3,917,303
43.23 3,917,304
93 3,917,305
104 3,917,306
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124B 3,917,308
124F 3,917,309
150AB 3,917,023
150C 3,917,310
238 3,917,311
242WC 3,917,312
284 3,917,313
432 3,917,314
457 3,917,315
460R 3,917,316
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117 3,917,970
205 3,917,958
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252UA 3,917,962
254 3,917,963
304 3,917,964
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20 3,917,362
35 3,917,363
36.1 3,917,364
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30 3,917,974
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18D 3,917,979
33VR 3,917,980
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260 3,917,986
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135 3,917,987
138 3,917,988
231 3,917,989
CLASS 320
35 3,917,990
CLASS 321
8R 3,917,991
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6 3,917,992
75N 3,917,993
CLASS 324
34R 3,917,994
54 3,917,995
72 3,917,996
166 3,917,997
CLASS 325
3 3,917,998
40 3,917,999
64 3,918,000
137 3,918,001
CLASS 328
48 3,918,002
CLASS 330
29 3,918,003
30D 3,918,004
99 3,918,005
CLASS 331
1A 3,918,006
94.5M 3,918,007
108B 3,918,008
CLASS 332
9T 3,918,009
CLASS 333
10 3,918,010
11 3,918,011
30R 3,918,012
72 3,918,013
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14 3,918,014
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145 3,918,015
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285 3,918,017
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28 3,918,018
42 3,918,019
114 3,918,020
128 3,918,021
134 3,918,022
180 3,918,023
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16R 3,917,370
19 3,917,371
75M 3,917,372
89R 3,917,373
111 Re.28,604
3,917,374
112R 3,917,375
117P 3,917,376
192RL 3,917,377
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3,918,025
40 3,918,026
146.1F 3,918,027
146.3AG 3,918,049
146.3SY 3,918,029
146.3F 3,918,028
172.5 3,918,030
3,918,031
173R 3,918,032
3,918,033
236 3,918,034
244R 3,918,035
248B 3,918,043
259 3,918,036
267C 3,918,037
324AD 3,918,038
3,918,039
3,918,040
336 3,918,041
347AD 3,918,042
3,918,048
3,918,050
347DA 3,918,046
347DD 3,918,047
347SY 3,918,044
3,918,045
365E 3,918,051
366E 3,918,052
380 3,918,053
CLASS 343
5DP 3,918,054
5R 3,918,055
6.5LC 3,918,056
6.8R 3,918,057
7ED 3,918,058
7PF 3,918,059
7.3 3,918,060
8 3,918,061
702 3,918,062
722 3,918,063
783 3,918,064
872 3,918,065
CLASS 346
17 3,918,066
CLASS 350
3.5 3,917,378
3,917,379
3,917,380
7 3,917,381
61 3,917,382
96WG 3,917,384
96C 3,917,383
252 3,917,385
289 3,917,386
CLASS 351
123 3,917,387
CLASS 352
113 3,917,388
CLASS 353
27 3,917,389
31 3,917,390
80 3,917,391
81 3,917,392
101 3,917,393
3,917,394
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5 3,918,067
17 3,918,068
23D 3,917,395
23R 3,918,069
25 3,918,071
62 3,918,072
120 3,918,073
213 3,918,074
3,918,075
219 3,918,076
234 3,918,077
296 3,918,078
CLASS 355
14 3,917,396
15 3,917,397
3,917,398
43 3,917,399
50 3,917,400
53 3,917,401
CLASS 356
71 3,917,402
74 3,917,403
85 3,917,404
87 3,917,405
88 3,917,406
97 3,917,407
116 3,917,408
125 3,917,409
133 3,917,410
135 3,917,411
152 3,917,412
197 3,917,413
200 3,917,414
CLASS 357
24 3,918,070
3,918,081
36 3,918,080

38	3,918,082	371	3,917,425	300	3,917,802	210	3,917,827	**CLASS 426**		**CLASS 427**	
39	3,918,083	**CLASS 404**			3,917,803	215	3,917,845			14	3,917,880
49	3,918,079	133	3,917,426	305	3,917,804	234	3,917,828	46	3,917,851	24	3,917,881
82	3,918,084	**CLASS 408**		321	3,917,805	242	3,917,829	48	3,917,852	68	3,917,794
CLASS 358		72	3,917,427	415P	3,917,663	243	3,917,830	60	3,917,853	108	3,917,882
4	3,917,415	130	3,917,428	449	3,917,806		3,917,831	92	3,917,855	198	3,917,883
	3,918,085	227	3,917,429	472	3,917,671	248	3,917,834	94	3,917,856	228	3,917,884
CLASS 360		**CLASS 415**		515	3,917,807	251	3,917,835	106	3,917,857	304	3,917,885
55	3,918,086	26	3,917,430	607	3,917,716		3,917,836	274	3,917,861	342	3,917,886
61	3,918,087	53T	3,917,431	617	3,917,793	253	3,917,837		3,917,862	343	3,917,887
66	3,918,088	118	3,917,432	626	3,917,808	258	3,917,838	283	3,917,863	433	3,917,888
	3,918,089	125	3,917,437	645	3,917,809	261	3,917,839	424	3,917,865	**CLASS 428**	
72	3,918,090	148	3,917,433	648	3,917,810	267	3,917,840	457	3,917,866	36	3,917,889
77	3,918,091	181	3,917,434	659	3,917,811		3,917,841	492	3,917,867	155	Re.28,606
85	3,918,092	**CLASS 416**		**CLASS 424**		274	3,917,842	497	3,917,868	228	3,917,890
96	3,918,093	20	3,917,435	7	3,917,812		3,917,843	535	3,917,869	337	3,917,891
	3,918,094	**CLASS 417**		20	3,917,813	300	3,917,844		3,917,870	383	3,917,892
132	3,918,095	5	3,917,436	23	3,917,814	305	3,917,864	536	3,917,871	395	3,917,893
CLASS 401		**CLASS 418**		45	3,917,815	317	3,917,846	537	3,917,872	414	3,917,894
34	3,917,416	150	3,917,438	61	3,917,816	319	3,917,832	568	3,917,873	421	3,917,895
72	3,917,417	**CLASS 423**		70	3,917,817	322	3,917,847	572	3,917,874	457	3,916,506
116	3,917,418	168	3,917,795	87	3,917,818	323	3,917,848	573	3,917,854	**CLASS 431**	
218	3,917,419	210	3,917,796	88	3,917,819	327	3,917,849		3,917,875	292	3,917,441
286	3,917,420	210.5	3,917,797	122	3,917,820	330	3,917,833	585	3,917,876	351	3,917,442
CLASS 403		242	3,917,798	125	3,917,821	333	3,917,850	594	3,917,858	354	3,917,443
12	3,917,421	244	3,917,799	128	3,917,823			602	3,917,859	**CLASS 432**	
15	3,917,422		3,917,800	150	3,917,822	**CLASS 425**		644	3,917,860	72	3,917,444
204	3,917,423	283	3,917,801	177	3,917,824	4C	3,917,439	656	3,917,877	124	3,917,445
287	3,917,424			204	3,917,825	18	3,917,440		3,917,878		
					3,917,826				3,917,879		

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	278 237,424		237,447		28 237,470		27 237,492		5BC 237,514	D52—	2C 237,536
	310 237,425		142 237,449		46 237,471	D23—	1 237,493		CB 237,515		237,537
	237,426		148 237,450		237,472		75 237,494		237,516	D54—	B 237,538
	237,427		201 237,448		109 237,473		237,495		GL 237,517		237,539
	381 237,428	D08—	9 237,451	D12—	53 237,474		35 237,496		VV 237,518	D55—	1C 237,540
	237,429		20 237,452		60 237,475		150 237,497		15AJ 237,519		237,541
D06—	7 237,430		56 237,453		85 237,476	D24—	1D 237,498		BB 237,521	D56—	4B 237,542
	20 237,431		67 237,454		98 237,477		237,499		B 237,520		237,543
	23 237,432		69 237,455		111 237,478	D26—	R 237,500		R 237,522	D61—	1K 237,544
	55 237,433		90 237,456		141 237,479		5C 237,501	D35—	3 237,523		Q 237,545
	60 237,434		98 237,457		146 237,480		237,502	D40—	1B 237,524	D67—	4 237,546
	63 237,435		99 237,458		147 237,481		R 237,503		E 237,525	D83—	1F 237,547
	237,436		220 237,459		155 237,482		237,504		237,526		237,548
	237,437		246 237,460		158 237,483		14A 237,505		237,527		237,549
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	156 237,439		149 237,462	D13—	1H 237,485		B 237,507		237,529		P 237,551
	175 237,440		237,463		7R 237,486		H 237,508	D45—	10B 237,530		R 237,552
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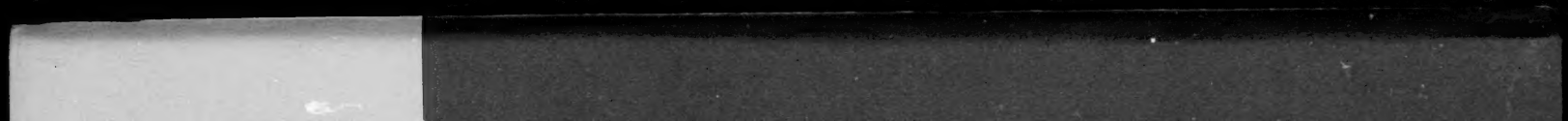
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